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APPENDIX

TO

Journals of Senate and Assembly

OF THE

TWENTIETH SESSION

OF THE

LEGISLATURE OF THE STATE OF CALIFORNIA.

Volume VI.

SACRAMENTO:
G. H. SPRINGER, STATE PRINTER.
1874.

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REPORT

OF THE

Joint Committee of the Senate and Assembly

APPOINTED TO EXAMINE INTO THE

MANAGEMENT OF THE UNIVERSITY OF CALIFORNIA,

INCLUDING

THE ADMINISTRATION OF THE TRUSTS CONFIDED TO THE
REGENTS THEREOF.

G. H. SPRINGER.........STATE PRINTER.

REPORT.

Mr. President: The joint committee of the Senate and Assembly, appointed to examine into the management of the "University of California," including the administration of the trusts confided to the Regents thereof, and to report to the Legislature in the premises, respectfully submit the following report:

The resolution in pursuance of which the joint committee was appointed, was adopted by both branches of the Legislature on the seventh day of February, eighteen hundred and seventy-four; on the ninth day of said month the committee was appointed; the work of the session had by this time become onerous, and the members of the committee were much pressed with their regular duties, and could not, in justice to the State at large, as well as their own immediate constituents, devote as much time to this special work as its importance demanded; this the committee much regretted, but could not avoid. They have given the matter such attention as their time would allow.

The committee met at Berkeley, on the twenty-third of February, eighteen hundred and seventy-four, and organized; it was then determined to submit to the Regents of the University the points upon which we were directed to report, and required them, at an early day, to furnish us with verified responses to the several points of inquiry, in order that we might have before us information sufficient to enable us to form a basis of future action—which points of inquiry were as follows, viz:

First—What instruction has been given in Agriculture and the Mechanic Arts in the University of California; whether the same has been defective or not, and if, defective, wherein such defects consist, and what is the cause, as well as the remedy of such defect?

Second—What has been the management, by the Regents of the University of California, of the one hundred and fifty thousand acres of agricultural lands donated by Congress to the State of California, and by the State to the University; whether the same has been defective or not, and, if defective, wherein such defect has existed, and what is the cause, as well as the remedy of such defects?

Third—Whether or not the Regents of the University have properly administered the funds of the University which have been intrusted to them; and if not, in what particular?

Fourth—Also, upon any other matters relating to the University, upon which, in the opinion of the committee, further information may be of use to the Legislature or the public?

On the ninth day of March, eighteen hundred and seventy-four, the committee met at the Capitol, at which time and place the Regents and Faculty presented their responses, above referred to, in a printed pamphlet, which accompanies this report. The committee, at the same time, heard all parties present who desired to be heard in the premises, including Mr. Baxter, who appeared on behalf of the State Grange of the Patrons of Husbandry.

The committee also issued subpœnas for such witnesses as they were advised it would be profitable to call before them, and on the twelfth of March, again met to examine such witnesses; at which sitting the committee examined Mr. Swinton, an ex-professor of the University, whose testimony tended to show two things:

First—That the management had been judicious, and had accomplished much good—as much as was reasonably possible under the circumstances.

Second—That he was dissatisfied with the theory of having a President of the University, and did not have the highest appreciation of the gentleman now filling that office.

This witness desired to file a paper to fully present his views on the subject, and permission was granted by the committee, whereupon he filed the paper herewith presented, in which he has manifested, in the judgment of the committee, an improper spirit. This written statement, also, in our judgment, is not consistent with the sworn statement made before them, as an inspection will show. The students of the University, on hearing of the course pursued by Mr. Swinton, adopted and forwarded to the committee certain resolutions, expressive of their feelings in the premises, which are herewith presented with the other documents, and marked "Exhibit A."

Professor Carr, who occupies the Chair of Agriculture in the University, was also examined by the committee, and gave a very clear statement touching the difficulties which have been encountered by the Regents and Faculty in the management of the institution. From his statement, the committee were led to the conclusion that all had been done in the advancement of agricultural matters that could have been reasonably performed with the means at hand, taking into consideration the youth of the institution, and the fact that the lands belonging to the same have been but recently surveyed and laid out.

The Patrons of Husbandry, who seem to have taken a lively interest in the University, furnished the committee with questions to be propounded to the Faculty, which are also herewith presented, marked "Exhibit B." These questions were forwarded to the Dean of the Faculty, and his reply, with documents accompanying it, are herewith presented, marked "Exhibit C" and "Exhibit D."

This completed our labors relating to the ascertainment of facts, as our time would not permit us to proceed farther.

The conclusion at which your committee has arrived is, generally, that the Regents and Faculty of the University have done as well as any reasonable citizen could expect. Our State is young, and the University is in its very infancy. We could not, therefore, reasonably expect, at this date, any great results. We do not gather ripe and luscious fruit from very young trees—they must have time to grow; so with our institutions of learning. There seems to be a few objections made by some to the plan of having a President of the institution. This, in the opinion of your committee, is mere idle theory, for, in the nature of things, there must be a head to the Faculty, and the name by which it is known is of no consequence; but it is claimed by some that this head should be elected by and from the Faculty. This, we think, would be productive of great evil—breeding contests for the place that would be ruinous to the Faculty. One ground of complaint has grown out of a misapprehension of the intent of the grant made by Congress. It seems that many persons supposed that the grant was intended solely for the foundation of a school devoted to agriculture and the mechanic arts, and that labor in these two branches was to be the main feature. This is a great mistake, as the plain language of the grant clearly demonstrates; it says that "the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts." This is being done in good faith, and the Regents are showing a laudable zeal and ambition in the work. We desire to give our most heartly approval of the management of the land grant. The Regents, in our judgment, have made the most of it; and their administration of it has been about the best possible.

In conclusion, the committee, in its best judgment, are of the opinion that the Regents and Faculty have done well, considering their means and surroundings; that they deserve the sympathy and support of the people at large in the management of the University; that the objections and criticisms made sprang from three sources:

First—There has been a want of a clear understanding, both as to the grant and the management of the University;

Second—There has been some jealousy and bad feeling with some persons connected with the University;

Third—Some persons, seeking to curry favor with the people, and for the sake of political notoriety, have pretended to be the friends of the people, as against the University management—not that such persons knew or cared about the University or its success; to which may be added the general spirit of rush, hurry, and impatience of our people in all matters—a people not ready or willing to wait very long for good results in anything, but are more inclined to jump to the conclusion that everything is a failure that does not, to use a California expression, "pan out" good results at once.

All of which is respectfully submitted.

LAINE,
EVANS,
T. J. KEYS,
Senate Committee.

AMERMAN,
TINNIN,
MEYERS,
FREIDENRICH,
CANFIELD,
House Committee.

TESTIMONY

TAKEN BEFORE

The State University Special Joint Committee

OF THE

SENATE AND ASSEMBLY.

TESTIMONY.

State University of California,
Berkeley, February 23d, 1874.

Present—Senators Laine, Keys, and Evans; Assemblymen Amerman, Canfield, Meyers, and Tinnin.

The committees of Senate and Assembly organized as a Joint Committee, and received the Board of Regents, at whose request the following resolution was adopted:

Resolved, That we furnish the Board of Regents a copy of the resolutions, and ask them to furnish us, at their earliest convenience, with detailed and verified statements responsive to the questions propounded in the resolutions.

The committee then adjourned.

State Capitol,
Sacramento (Cal.), March 9th, 1874.

Present—Senators Laine, Keys, and Evans; Assemblymen Amerman, Canfield, Friedenrich, Meyers, and Tinnin; Regents Haight, Stebbins, and Dwinelle; Messrs. Moulder, Stearns, and Baxter.

The Board of Regents presented "Statements of the Regents of the University of California," contained in a pamphlet that is subjoined to this report.

Mr. Haight read statements in response to the third inquiry.

He then said: before President Gilman takes up this matter of instruction, I have only this remark to add, and I think I express the feeling of all the Regents. We think we have done well in administering the trust, with all the light that we have had upon the subject; and what we desire is, that upon such recognition by the committee, we would like to have them say so emphatically. If we have not done well, why, I think the sentiment of the Regents is that we would be entirely content to be displaced.

We would like, after a careful consideration of the whole subject, that the committee, if they are of the opinion that the trust has been well administered, they will say so.

Without taking up too much of your time, I will say that, in some cases, we are able to show clear gains; in others, we have met with difficulties and embarrassments from time to time, and have examined them, we think, with as much success as could be reasonably anticipated.

President Gilman will read that portion relating to the matter of instruction; then Mr. Moulder will take up the subject of lands; he has had the charge of them more particularly.

We would like to have you, gentlemen, put any questions as may occur to you.

Mr. Gilman read the "Statements of the Regents in response to the First Inquiry," and particularly called attention to section (b) and made the following comments:

Now in order to show you exactly what is doing in the way of instruction, the Regents addressed a letter to the Faculty, and they received the following reply.

[The report of the Faculty will be found in the "Statements of the Regents."]

The way it was done is this; the request was made by the Regents that they should refer your resolution to a committee. That committee drew up a statement, and read it in a meeting of the Faculty, and was approved by every person, and all expressed their entire concurrence in it. This statement is a unanimous statement of all the professors.

I will only make a few points during the reading.

We have a most admirable Professor of Physics in Mr. John Le Conte; particularly in the instruction of chemical analysis the course is a great step forward, and I believe the two Le Contes are better than you will find in almost any part of the country.

The necessities of the University are somewhat expanded in the twenty-ninth and thirtieth pages of the biennial report for eighteen hundred and seventy-two and three.

Mr. Laine—In the instruction under the head of engineering, do you teach anything in regard to irrigation and drainage?

Answer.—Certainly, all of them are thoroughly instructed.

One of the Regents, before the Legislature came together, before, at any rate, these inquiries were made, went around among his friends and raised fifteen hundred dollars, a guarantee of fifteen thousand dollars a year, for two years, for making experiments in order to determine a desirable course of instruction in agriculture.

I don't know that it is quite time to make it known, but we have pretty good reason to believe that this experiment is to precede a generous fund for more extended facilities of instruction. Probably those who have not given attention to it, have no idea of the great embarrassments that prevail all through the country. If your time was not very precious I should dwell upon this point. We have by every means, by correspondence and personal interviews, from almost all kindred institutions in the country, made a specialty to look into it to see that we are minutely informed. The local complaints have made the Regents very cautious.

We found on examining the property at Berkeley some discrepancies in the boundaries, and had to spend a good deal of time in getting the lines straight. It became necessary to make a good study of the springs.

Q.—Those springs, were they in the two hundred acre tract or outside of it?

A.—Outside of it. They have been controlled by the University. About this matter of laying out the grounds, we had the Gardener of the State Capitol, and a gentleman from San José that has had a good deal of experience, and another who has made vegetation a study. Finally, all their data was placed in the hands of the engineer of the Golden Gate Park, of San Francisco, Mr. Hall, who has nearly solved the problem which the great landscape engineer, Omstead, said he believed to be impossible in this climate—the growing of trees and shrubbery in the midst of sand hills and under the incessant trade winds of Summer. Mr. Hall has, for the last seven or eight months, been at work upon the study of this site, to determine, in the first place, the proper places for buildings; in the second place, roads and paths; in the third place, proper drainage; fourth, particular uses of ground.

[A map was then shown to the committee, and explained; it was a photograph of the original.]

One of the rumors afloat is that this whole thing is going forward without any plan; the plan is a very substantial one.

Q.—Has the Professor of Agriculture made any complaint about the room which he occupies, of insufficient accommodation?

A.—Nothing to the Regents; I may have heard him speak of it. The building, when constructed and ready for use, had one lecture room, which is open to any professor. Professor Carr desired to have the large room on the north side, and it was at first intended that he should go there. There seemed to be no other place where the laboratory should go; the cases had all been planned, and could not be removed for want of space. When I came here a little more than a year ago, there was talk of building the President's house. I said, "I don't want you to; I will do it myself;" and I said, "If you will pay the money which is provided, and build a library building, I shall be much more pleased;" but it did not seem practicable, and had to be given up. Then we had to put our library somewhere, and we put it into this north college.

Mr. Dwinelle—That room is very pleasant?

A.—Yes, sir; you can look out twenty miles, out from the Golden Gate, from it. It is quite as pleasant as the lecture room. It is too bad to bring such a matter forward before the public. The professor should have made his complaint either to the Faculty or Regents. I could not tell you—I don't believe nine tenths of the professors could tell you the number of students in each specialty. Here are three or four studying chemistry, three or four agriculture. We know no difference as they are, whether they are in natural philosophy, political economy, or history. When they come to the professor they commence engineering, chemistry, as they choose, but they run together in all the other studies. I think every student in the University has all the facilities of the highest advantage, if he has the time and capacity to use them. There are seventeen or eighteen professors and instructors that are now teaching. Now they teach agricultural students, and the subjects which they teach are not merely literary studies. Professor Rising teaches chemistry; another botany, etc. Now, gentlemen, will you permit me to say one thing further. Years ago I had the opportunity of knowing the Agricultural Bill from its beginning; had frequent conversations with the author of the bill, Mr. Morrill, of Vermont. I have made it a business for years, not only to collect, but read and study other reports. I came over here and found this concern organized. I have been surprised and delighted, and I can hardly express, when I have consulted with others, considering the difficulties, perplexities, which belong to the locality; difficulties which beset you here. It is incredible that you have done so much; and I also wish to add one other thing. I have made a little collection of data about some of the most recent discoveries in the Cornell University—in the knowledge of the cycle of plants—in the Pennsylvania College, in the Massachusetts College, and in several others. All over the country the same difficulties and perplexities are felt which you suffer here. There is a comparatively slight demand for a long course in agriculture; not one such as would be expected there would be, partly because the farm itself is thought the best place to learn, by many, and not the formal College or University. While there is this discount for agricultural teaching, the professors are making researches—have found out something about the agricultural region, and their publications of information are worth all they cost. At Cornell they are greatly disappointed; they have but —— students in agriculture out of five hundred, in all; but they are so well pleased with the experimental research and results of publication, that they are saying, "Never mind that at all." I have made an investigation of these researches at Amherst College. They say, "Must not mind it." We are assured by Agassiz that their researches on the circulation of sap in plants was worth all the cost. Farmers in Connecticut were obliged to employ them, and many others. In regard to the manufacture of fertilizers, they have exposed the frauds and saved the State more than the College cost.

Mr. Amerman—There has been a good deal said to me, as a member of this committee, and I don't know but what it is true. Comparisons are drawn between Cornell and this University. I would be glad to hear you give any information about it—I would like to ask you, as I suppose you are informed, how does the course of instruction now being pursued in the State University, or held out to be pursued, compare with that at Cornell?

A.—I should say we are working upon exactly the same principles, but they have had larger facilities given them, particularly on the practical side; but I would also say that they are greatly disappointed in the result of all that. I have been corresponding and advising with the President on all these subjects. We believe that it is one of the most fortunate circumstances that we have been so situated that we could not extend ourselves largely in the practical demonstrations they have made, which prove that we have been the gainers of our circumstances that forbade us to make these expenditures that have been so disappointing on the whole. It was reported that I stated in my address to the Legislature here, that I stated that out of four hundred and sixty-one, only seven were agricultural students. This has been very much disputed in the newspapers. I believe I am right; here it is, at any rate: Total, four hundred and sixty-one. And then the four departments are given: Agriculture, seven; Mechanic Arts, one hundred and ninety-nine; Literature, seventy; etc.

Mr. Stebbins—Won't you state how this discrepancy appears—how many students have there been under the law of eighteen hundred and sixty-two?

A.—Now, I never knew how to answer that question; shall I say there are one hundred and ninety-nine students in the knowledge of the mechanic arts; how many come under the instruction which would include the whole number one hundred and ninety-nine; or should I go round and ask each of the individual members: Are you aiming to be proficient in the mechanic arts? Somebody has reported the number of students as I gave it; I merely quoted the exact language of the catalogue. He is talking of a certain Dr. McCosh, who argued from the small number of students. I do not believe that for some years the numbers will greatly increase.

Mr. Stebbins—And precisely about the time Mr. Gilman was delivering his address, one of the most eminent lecturers, who has been associated with Cornell University, the distinguished Mr. Smith, was lecturing in England, and set forth the same sentiments in England, in regard to disappointments that had been experienced.

Mr. Laine—Have you the catalogue for the year previous, of the same institution?

A.—The year previous, twenty-eight attended lectures—total number, five hundred and twenty-five.

Q.—In the University of California, they fell from sixteen to seven?

A.—Yes, sir.

[Mr. Moulder, ex-Secretary of the Board of Regents, read the response to the second query—"Management of the Agricultural College Lands."

Mr. Laine—Is there any land remaining unsold?

A.—We have actually oversold our grant to the extent of over—it is stated that the number of acres sold for which title has been issued is fifty-one thousand and twenty-three and ninety-one one hundredths acres.

Q.—There is fifty thousand acres that have been certified over?

A.—More than that.

Q.—Have you got the statement?

A.—No; I have not. Have received a letter containing it, and I remember it is sixty-two thousand acres.

Q.—Have they been actually certified over?

A.—Have been listed to the State.

Q.—Then you have realized five dollars per acre net; that is, the expenses have been paid out of the proceeds that went above that figure?

A.—Yes; the expenses were paid out of a variety of sources.

Q.—Is there any doubt that the applications cover land enough to release the University from their obligations? Are the one hundred and fifty thousand acres to be certified?

A.—Cannot tell you exactly, and being in doubt, we must wait until we see from the various Registers upon the ninety thousand acres pending in their hands. How much they will reject we don't know, and hence it is unsafe to go on selling any more, unless it should afterwards turn out that the Government would not permit us to give a title. At any rate, it is the policy of the Regents not to expose them to embarrassments. Probably, in ten days we can tell exactly how we stand. My impression is, from the character of the contests, that more than four thousand—I should say twenty thousand—acres would be rejected; if they are, then we will have fifteen thousand acres left, or the University could sell fifteen thousand acres. Some parties come to me appealing just to let them have twenty acres. One of them said he would rely upon —— to fortify his title; and it was the only means by which it could be done.

Mr. Laine—Would it not be good policy to issue on contingency?

A.—Yes, sir; just at this time the demand is extraordinary. In one week twelve thousand acres were sold. It is surprising to see how many apply for forty acres.

Q.—Do you happen to know of land selling at much reduced rates?

A.—I have, sir; was informed from the gentleman purchasing; he told me, from Mr. Chapman. He bought hundreds of thousands of acres with scrip.

Mr. Stebbins—The statement is that they were sold for forty-five and forty-seven cents an acre in currency.

Mr. Dwinelle—I don't know of any State which has effectually secured titles to lands of a University, excepting Cornell—they have nine thousand acres. It cost them thirty-three cents an acre. Under the original Act our lands never could be sold at all.

Mr. Meyers—Is not the Act of eighteen hundred and seventy-one liable to complaints, that as applications are filed after all the affidavits that they make, the township is, as it were, tied up? If any one goes and makes an application for any portion, he files a preëmption, but intends to put improvements on the land, they are liable to be taken up by this patent after the survey is made?

A.—That was attempted in one case, but every precaution was taken to prevent it. The party undertook to postpone selection of his lands until the expiration of thirty days, but he was answered that he must describe them immediately, so as to give other parties an opportunity; the second party was one day too late.

Mr. Laine—How, if the University were dealing in the land in this way, and homesteads and preëmption claimants would claim in this way, would they run the risk of having their lands gobbled up and taken away from them?

A.—If a party should come into a township that was unsurveyed, then he should make application for forty acres. Now from that time until the township should be surveyed, no party that should go inside of that tract and make improvements would run the risk of having them taken away by this plan, as we understand it. He has thirty days prior right of filing on any land within the township. This is as it is, sir. The laws require that in applying for unsurveyed lands he shall describe them by township and range, it being thought impossible, where the lands are unsurveyed, for him to be more particular.

Q.—Suppose this were to occur, have you any means to relieve actual settlers?

A.—I have never known a case to occur. I don't know that any such case has occurred.

Mr. Meyers—I have heard of one case in Butte County—it was the occasion of the introduction of a bill?

Mr. Amerman—Have you any knowledge of any difficulty up in Butte County with the Board of Regents?

A.—I have not, sir.

Mr. Laine—I would ask you to state if you have not canceled those homestead applications, for the reason that there are preëmptors there?

A.—Yes, sir; I think you are one of the parties in Santa Clara County. And another thing, to show you there is a certain point where the Regents cannot control the matter, but where it has reached that point they can often invalidate it, and a striking case, showing the feeling which they entertain, occurred not a great while ago, where a certain party had applied for a piece of land, and a title was made out, and the land was put in the market; subsequently it turned out, that there had been a person settled on the land for fifty years. It was in San Joaquin County, by the by, Mr. Meyers. He came down concerned and distressed, and at a meeting of the old Board of Regents, he asked to have them remove this injustice. They took hold of it with a feeling of a great desire to help him—to relieve him. He had nothing to show on the Register's books, at all, that he had any title whatever; but he was greatly surprised to have them plastering a title over him. He came to the Regents in person and made his appeal; they said, what shall we do. We told him that we would see the other party and do all in our power to exert all our influence with him—to get him to abandon it, and would employ all our influence to make him give it up, etc. The Regents went to work, individually. The land was worth fifty dollars an acre; he had paid five; and finally prevailed upon him to surrender his title, and they returned him his money, to the great delight of the old man.

Mr. Dwinelle—Mr. Laine knows of a case where the land, if we had abandoned the land, we should have lost more than five hundred dollars an acre.

A.—No human law can be devised but what is liable to abuse; but you will see, if you listen—there are now one hundred and fifty thousand acres of unsurveyed lands—there are applications for over two hundred thousand acres; but these we don't recognize.

Mr. Meyers—It was very obvious, they preferred to wait?

Mr. Dwinelle—We have never heard from the parties introducing the bill. The party that has brought up this complaining bill, that has introduced a complaint, is in town now.

Mr. Meyers—The bill was withdrawn in the Senate and is now in the House. You refer to ex-Senator Allen?

A.—Yes, sir; I have met him to-day, and I understand the provisions of that case.

Mr. Amerman—Is that in Butte County?

A.—Yes, sir; well, I understand the truth of the matter is that Mr. Allen was just one day too late in making his application to the land. He wanted a certain tract of land—timber land in Butte County. Suppose his mills were on the land. A certain party wanted these same lands and he was just twenty-four hours ahead of him in making these applications. That is the very case I told you about. Number one, he was ahead. I told him "unless you make your applications within such and such a time, so as to give Mr. Allen notice, I will give him twelve days," and Mr. Allen did have plenty of time to look up these lands, but it happened number one took some desirable lands which Mr. Allen wanted.

Mr. Tinnin—Was you aware that there was a sawmill on the creek?

A.—No, sir; I was not.

Mr. Amerman—It has been represented, Mr. Moulder, that Mr. Allen had valuable improvements—one or more mills upon the land; do you know whether it is a fact that they are on this particular land or the lot of land adjoining it?

A.—I am informed by the party that the mills are not on the lands, but that the land that number one got just twenty-four hours ahead of number two would be very desirable by the owner of that mill, who was disappointed. The owner of the mill is a preëmptor, but he had acquired no rights after the land was surveyed; he was protected by this very law; it was utterly impossible to put the University title to them. I inquired of Mr. Dwinelle, and he says the law reads: "Provided, that any rights under the preëmption State law shall not be impaired or affected by this law."

Mr. Laine—If they have sold land simply under that proviso, the suit is had in the United States office, and has been defeated?

A.—Now, it would not happen in this way: Number one takes a certain number of acres, and it is certified; number two comes in and says, I want thirty-two thousand acres. Very well, says I, there are fifty-four thousand acres, and you can take thirty-six districts—each district is six hundred and forty acres—and there is plenty of room for both. But, says number two, I am a little afraid that number one wants the same lands; I have a very valuable sawmill up there; I think he is only trying to get that in order to blackmail me. I said, this is very unfortunate that you did not come twenty-four hours ahead; there is no means of ascertaining whether he has purchased bona fide or not. Mr. Allen spoke to me. I told him that it was not necessary for the Regents to give it to number one, if he should test it.

Q.—Give us your reasons why the one providing for a trial of test cases in the Court.

A.—We have not obtained a title to it yet.

Mr. Haight—I think that is the land that was spoken to me about; there was no improvement on the particular land, but it was timbered and desirable.

A.—I think it is safe to say that number one did not take the land on which the mill was situated.

Mr. Stebbins—Do you know on what conditions that mill was there—is the man a trespasser or preëmptor?

A.—The man who owned that mill was a trespasser; he had been cutting timber there for years on the Government unsurveyed lands.

Mr. Meyers—My recollection of the representation that was made to me, was something like this: that the party had made prior application, but that the land was unsurveyed. The other party had gone into the same township and made his improvements; and in consequence of this power to float timber, his improvements were liable to be taken away from him?

A.—Never was, sir.

Mr. Stebbins—The section of the law will not forbid it?

Mr. Meyers—Since then, I was asked to withdraw it, and I did. The committee reported a substitute for the bill, and since then, this party thought he did unwisely to withdraw. It passed the Senate, I believe, and came to the House.

A.—I have had a conference with Mr. Allen; he has spoken about the bill to me, and asked me if the Regents would have any objection; it would relieve them of a very grave and onerous duty. The bill provides in cases of contest between parties for the same land in the Agricultural College grant, that the case should be tried by the State Courts, and the Regents would abide the decision of the Courts; instead of harrassing the Regents, by this they would decide the case. I told him the Regents would be very glad to be relieved of such an investigation as that.

Mr. Dwinelle—Decidedly. The complaint of Mr. Allen does not come to the position where the Regents can decide it yet. Allow me to suggest whether it is probable that the Land Office will allow any contest in the State Courts?

Mr. Laine—The Federal Land Office; of course, it cannot.

Mr. Dwinelle—This don't affect the statement that we have made, that in all these cases we have preferred the prior locator. The only point is whether we will get the right.

Mr. Amerman—Is not that substantially Mr. Gray's bill?

Mr. Meyers—That is a very different bill; it has passed the Senate since we came back from the University.

TESTIMONY OF MR. STEARNS.

Mr. Stearns, Secretary pro tem. of the Board of Regents, was next examined as to Mr. Gray's bill—"Assembly Bill Number Two Hundred and Ninety-two. An Act concerning the selection and sale of the University lands." He said: I have been before the committee of the Assembly in reference to this bill; we explained the matter fully, section by section. In reference to Mr. Moulder's statement, there are four thousand acres that, when granted, had been paid for.

Mr. Dwinelle—There are no unsold portions; it doesn't change the price.

Mr. Stearns—There is another section on that, which comes afterwards. Section third, you see, takes the contests into the State Courts. Instead of such Land Department it was issued by the Regents.

Mr. Haight—Mr. Moulder acts as a Trustee of the parties making applications. As I understand the condition of affairs, there are no moneys whatever in the hands of the Land Agent belonging to that fund; payment is made to the Treasurer. The Land Agent simply holds a security, not a payment.

Mr. Laine—If the application is continued, when he gets the money, it is paid over to the Treasurer.

Mr. Haight—If the application is rejected he has not to refund that money back again.

Mr. Stearns—So far as regards those lands, we are only entitled to use the money for the institution—section six. These Courts will compel the Regents to file the contracts made with the parties.

Mr. Laine—It will give five years credit?

Mr. Moulder—At the end of five years it will be paid.

Mr. Meyers—In case of timber lands you will require immediate payment?

Mr. Moulder—Either that, or a bond with a personal security, that the parties will pay for the lands.

Mr. Laine—That is to prevent stripping of the land.

Mr. Haight—That is it, precisely.

[Mr. Stearns read section seven.]

Mr. Moulder will state to you that it will be utterly impracticable to turn over the account in ten days' time.

Mr. Moulder—There are over sixteen hundred land accounts, and it has grown to be a most enormous business to keep the record of so many applications, to avoid confusion.

[Sections eight, nine, and ten, were read.]

Mr. Dwinelle—Now the committee must not be surprised if some of the Regents do not understand all these matters in detail, because the business has been so great that the matter has been turned over. I understand from Mr. Moulder, who has been Register in the Land Office, that it really takes away from the Board of Regents and from the State, from the University as beneficiary of those lands, all those advantages that have been gained by those bargains; that whereas, the office ought to pay about five dollars an acre, the ordinary purchaser gives him no advantages that he would not have over other colleges. He says he can explain it satisfactorily; it changes the whole land system. We have sold these lands, as Mr. Moulder says, on five years credit, at ten per cent a year. Now that is a thing Mr. Stearns has not explained, and which is of very great consequence to the University. Another thing, this treats the Seminary Fund, the University Fund, as though they still existed in lands, whereas, they have all been sold. Now the one hundred and fifty thousand acres—in regard to that, it is provided in the law giving them to the State of California, for buildings of the University, it is provided that the interest on the principal shall remain a permanent Fund, and no more than ten per cent of that can be used for agricultural buildings, etc.; the rest must be invested in United States bonds, at an interest of five per cent. We ask Congress to allow us to invest that land in productive unincumbered real estate, under such restrictions as they may impose, supposing it to be in the discretion of the Judge or United States Attorney, and that will undoubtedly pass. Mr. Swift can undoubtedly demonstrate to you the effects of this bill.

Mr. Baxter—I am here before you in relation to this agricultural matter upon a subpœna, and at your service, if you have any questions to ask me. I have some little statements I should be very much pleased to make.

Mr. Laine—You will go on and make any statements you please.

A.—I am here, as I said before, at your request, representing the committee appointed by the State Grange, I being the only member of that committee available at this time, representing the agricultural interest so far as it comes within my province, and I am very glad to have the opportunity of meeting with the gentlemen—the Board of Regents of the State University. There is, sir, as I understand, and as the agricultural people understand, in this State, something that needs explanation. They are scattered all over this State. They know that they are paying money to this institution for the support of it, and they are expecting a benefit in return. I have been questioned, in traveling about the State, what they are doing. I have been able to say that they have been erecting fine buildings there, and I believe that they have been educating the students to the best of their ability, doing a great work. "What are they doing in the agricultural studies? It is an Agricultural College, is it not?" "Yes, ostensibly so." I confess my inability to explain satisfactorily to them what they have been doing. It is true that the occupancy of the present site is but of recent date; but, sir, there are improvements upon the lands there, and I would like to ask the gentlemen, for information, how long since the planting of the trees commenced on the grounds?

Mr. Moulder—That was in eighteen hundred and sixty-seven.

Mr. Baxter—Some four years ago?

Mr. Moulder—Yes, sir.

Mr. Baxter—Well, as I said before, I have been unable to explain. I have been on the grounds, but I could not explain satisfactorily that anything of very great extent, from an agricultural point of view, had been done. I find by referring to reports, and to a document which is in my possession, that under this same law in other States, and even as late as eighteen hundred and seventy-two, that they have been doing a great work. It seems that we cannot do as much in California as in other States. It is a most remarkable thing to me. With your permission, I will just refer to this report, because I desire at this time to become so well acquainted in relation to this matter that I can intelligently explain to those who are interested in them [Mr. Baxter then read extracts from a document, under the head of "Special Information

Respecting General Agricultural Education," which he said proved that its utility was practically demonstrated.] And when the statements were made in the memorial, upon the basis which they considered official—in reply to this, I have here in my hand the official report of the Department of Agriculture for eighteen hundred and seventy-two. This, of course, does not come down to eighteen hundred and seventy-four; it only includes the year eighteen hundred and seventy-two; yet in this, sir, it appears that there are thirty different States which have thirty-eight industrial institutions, which have received a national endowment, and, without occupying too much of your time, I desire to see whether I am in error in relation to this, or whether you have been informed in relation to it. The language of the resolution would seem to indicate that there are vague rumors afloat, but as far as I am concerned, I know nothing about outside influence; I am only here for the purpose of setting myself right before the committee as one of the memorialists.

[Mr. Baxter then read an account of the institution in Alabama and Arkansas, as to the land cases, number of students, which are given at detail.]

Here is a college consisting of three hundred and eighty-four acres, of which forty-three are plowed for crops, which are described.

Q.—Where is that farm located?

A.—At Amherst.

Mr. Stebbins—I want to call your attention here—you speak with confidence in regard to the Massachusetts matter; now, we shall show that the money on the Massachusetts farm has been squandered; that report is not official—it is official, but not authority.

Mr. Baxter—It is the official report, published by the Department at Washington.

Mr. Stebbins—I suppose it is the very thing—excuse me for interrupting you, sir.

Mr. Baxter—Fifty-seven students have graduated, and a large portion of them have engaged in manual pursuits. On page three hundred and seventy-six, speaking of Pennsylvania College, there are three experimental farms, each containing one hundred acres, under the general supervision of the College. Then follows an account of the numerous experiments which are going on, the number of acres cultivated. I have Cornell here. I desire to say it is among the list, and that seems to have been misunderstood in some way or other. The Agricultural College contains two hundred acres. There is a serious discrepancy somewhere, and I don't propose to allow it to rest upon the memorialist. You allege that misrepresentation has been made in relation to this matter. We wish, if it is possible, to arrive at the truth. Now, here is the facts, so far as this may be taken as a basis: The farm consists of two hundred acres of land, containing meadow land, etc, shown in detail. Here is an experiment of farming for you; just what the people of this coast want here, just what they are looking for, and just what will satisfy them. Next, there is a list of all the farm implements, thoroughbred horses, etc. Here follows, after this, a list of the professors who are to deliver a certain number of lectures, the donations which have been made, and winding up with the number of students; in eighteen hundred and seventy-two it is two hundred and seven, and in the University it is five hundred and twenty-five. These facts will show what ought to be done in California. The people of this State, Mr. Chairman—the farming community—may be somewhat jealous of being made prominent in this matter. They believe that it was created for their special benefit and weal. They suppose that the farmer shall be looked upon as an intelligent man, while, as it is now, in the eyes of a certain class of people, they are looked upon as a degraded, lower class of beings, and as the General Government has provided means by which they may alleviate the complaint, they feel that their rights have not been accorded them. Now, sir, all the statements that I will make in relation to this matter is, that as a member of the committee, I desire, so far as is in my power, to find what will bring us into sympathy, harmony, and hearty coöperation. This is one step, but for all that, it is time, perhaps, to alleviate them with a liberal donation; and until that sympathy and that feeling shall exist in the hearts of the community, the hearty coöperation or assistance from that source cannot be expected. Here is another thing that I desire to say, with these gentlemen here, with the committee, and it is this; that the Agricultural College is scarcely mentioned. Classical education is made the prominent feature of the whole thing, in exclusion of the practical. They look over the list of Regents, and they say that there is not a farmer on it to represent their interests. They see lawyers, men of great reputation, and they say that: "What do they know about agriculture, and we want a representation in the Board of Regents. Then we shall know that our interests are looked after. Not but these gentlemen are good officers, and are doing a noble work; we appreciate it, but as a right, we ask that we shall have a representation on the Board of Regents, and there are gentlemen farmers who are eminently qualified to look after the Board of Regents—after the agricultural affairs of this State." They feel that they have a direct interest..

Mr. Amerman—In your remarks you say that you don't know whether it is a fact or not, Mr. Kerry is a practical farmer?

A.—I made this statement: that the people in this State say that we have no representation; I said that there was, I believed, one or two gentlemen who are interested in agriculture upon the Board.

Mr. Dwinelle—Do you know Mr. West Martin, our Secretary—one of the largest farmers in the State?

A.—I do not happen to be acquainted with any gentleman, except Mr. Haight; the rest of the gentlemen are all strangers.

Mr. Dwinelle—I would like to suggest that you just add something to the course of instruction.

Mr. Gilman—The list is fuller than it has been at any other time; I think that the catalogue could be improved. One other word regarding the document before you. I know that the present Commissioner of Agriculture is not at all a competent man, and I have not relied upon a public document three years old. I have not only been there lately, but here is the report down to June, eighteen hundred and seventy-four. I have a little pamphlet here that goes on to explain how difficult it is to get farmers' boys, and a great many other things. At Amherst they are embarrassed; they are in debt; a college surrounded by literary colleges, and all their advantages. About seventy out of two hundred and thirty-four students are known to be engaged in farming, or a kindred business. I don't suppose it is worth while to take up your time. At Westport, Massachusetts, is a Farm School; it has a broad range. They pursue their experiments entirely independent from others; but the great trouble has been, even in that State, where the avenues of business are closed, and farms are cheaper than in California, is, that boys don't want to learn agriculture. My idea is that we should teach the elements of horticulture, and inspire a desire to think upon the subject—put the boys in a way with a desire to pursue it.

Mr. Baxter—That is just the idea that I want to get at; I occupy a very peculiar position towards the agricultural people; I have, in the past year, become acquainted with the most critical matters pertaining to their interest, and it is necessary for me to be able familiarly, intelligently, to answer them.

Mr. Laine—Have you any studies that you desire to be added?

A.—None, whatever. If they are graduated, as is laid down, practically, it is all that they ask. A lady, last Friday, that I met on my way home, she questioned me in relation to an agricultural education; she has three boys; says she, "If I send them there they can get an elegant education, but I want them to be farmers, to learn farming." Now, what I want to get at is this; how shall I answer those friends intelligently? Shall I say that the Regents and the Faculty of the State University intend to carry out the idea of the agricultural Act and teach the practical workings of a farm there, or that they only intend to teach theory by lectures. This is the class of instruction that the farmers don't like. They are not educated up to that point yet. They want a thorough representation upon the Board of Regents, and their sympathy, their support would be given to it; but as long as they feel the way they do, it will not be given.

Mr. Haight—I have thought that feeling arose from the fact that they have not had the information which the very object of this investigation is to furnish, *i. e.*, to get it before the farmers. Some of us are spending a good deal of time, using a good deal of effort, which we would very gladly bestow in a way more remunerative.

President Gilman—I am not much in the habit of engineering compliments, but I can say this: he is a gentleman who is thoroughly familiarized with the workings of those institutions, and who is pledged to use all the effort that he can to accomplish it; and then, in addition to that, if those who have the immediate and intimate relations with the farmers would visit the University and take a personal interest in the affairs there, then you yourself would be in a position to explain all these matters more satisfactorily.

Mr. Laine—If I understand you, Mr. Baxter, you think that as one of the matters that farmers are interested in, is to have a portion of the useless time devoted to culture?

A.—That is the idea that they entertain; they think it is futile, or useless, to get what they simply call "book learning."

Mr. Haight—The means that we have had have not been sufficient to do all that the Regents desired to do. We have endeavored to use the funds to the best advantage. The corps of instructors in the University ought to be increased. The Regents feel the necessity, and so do the Faculty, but I, so far as I am concerned as one of the Board of Regents, feel the necessity for increased appropriations. But the appearance has been that it would not be a great many years before the endowments on the Agricultural College ground, that the endowments that we expect from private individuals, as there are a great many public men in San Francisco who will no doubt bequest large sums to the University, it will not come out of the public fund, of course, you see. These things are not to be done in a day; it requires time.

Mr. Laine—Well, the revenue at your command that can reasonably be devoted, how far would it go towards running an experimental farm; would it do it at all?

A.—No, sir; not at present, it would not only use up the interest but the capital.

Q.—I am supposing now you did that work, it would be impossible?

A.—Of course, it would have been impossible heretofore.

Mr. Dwinelle—A great many college farms have a showing like this—eighteen acres of blackberries, why should we raise a single bush? Why should we raise a single acre of wheat? We have got within the range of the University some of the largest and most successful farmers in the State; we have got all the experimental farms we want. We can put our students up to the mines, copper, gold, iron, everything but tin mines, within twelve hours; we have the offer also from the mechanic shops.

Mr. Stebbins—I am very glad for this interview with Mr. Baxter, in regard to the representation of the agricultural interest in this Board—that, the Board has nothing to do with it. It must be remembered, also, that our former Chairman was a member of this Board, ex officio. He has attended our meetings two or three times, I think. Mr. Kerry has been in our meetings but twice, and expressed great satisfaction. He is farming thousands of acres; he has immense numbers of sheep and cattle, and yet he does not come near us. There is another thing that I wish to call Mr. Baxter's attention to in regard to the feeling of neglect. Have you ever visited the University and become acquainted with the institution, with any farmers, or have they come there to study agriculture?

A.—Yes.

Q.—Have they expressed dissatisfation with the condition of the grounds?

A.—They have said this to me—I have had a talk with several of them—that they are studying what purported to be agriculture, taught by seventeen or eighteen professors there, but not practically.

Mr. Stebbins—You mean by practical agriculture, that a young man should be made a farmer at Berkeley, so that when he goes home he will be able to make money, and get a good living; is that the idea of an agricultural education?

A.—I will explain what the idea is: it is not simply to go and plow the ground; it is to understand and learn the nature of the soils, plant growth, with its development, to study and understand every phase of its circumstances, and when and how to operate upon it properly, so that when he comes home, he can tell what is best to put in, wheat or some other corn.

Mr. Stebbins—In regard to that, the theory comes first, I believe, in all studies; in all affairs, theory goes before practice—*i. e.*, your millstone must run in the head before it runs in the mill. The analysis of chemical laws must be made in the head. I suppose that is the theoretical part of agriculture, and it is the part which we are teaching. Now, in regard to this matter of the alienation of the agricultural portion of the community, I am sure, Mr. Baxter, it is because of want of knowledge of what we are doing. I was brought up on a farm, sir, and I can do more work now than one man out of ten that I can hire. I don't believe you could teach me a single strap.

Mr. Keys—I don't believe you could run a header, sir.

Mr. Stebbins—I don't know about running a header against a northwest wind. I have been instrumental in bringing three sons of farmers to the University; I have been so interested in bringing them there, that when I knew of their want of accommodation I have caused rooms to be finished off. I don't wish to say anything about what I have done, personally. I don't know whether these boys are going to be farmers or not; I don't know. "Good heavens," I said, "come here and study—rub up your brains—I don't care whether you are going to be farmers, doctors, or preachers." My idea is, to make a man first—to bring the man into conditions of thinking, observation, and study. Let me beseech you not to deceive the farmers, and to undeceive the farmers' sons, that we can make them men of judgment, make them learn principles of farm economy, by their coming there to study practical agriculture. The answer is not the will of man; it is not simply teaching them experiments in agriculture; not that we are great men, but those are great men who fashion the common weal. There is not one of us here who is not fired with the common zeal and love of the commonwealth—it burns in their breasts—and I call on you, as a leader of the State Grange, to teach the people so to maintain the commonwealth, whose honor we love, and whose glory we are proud of. Don't listen a moment to this alienation.

Mr. Baxter—One word in respect to that. I of course feel as deep an interest—it is the only interest that I have on the face of the earth, that of agriculture; and while the gentleman uttered those sentiments, I am still reminded, that the more practical, every-day farmer sees the necessity, year after year, as his children grow up around him, of becoming fully acquainted with the practical workings, as well as with the intellectual or the theoretical; but they feel the same interest, I doubt not, that the gentlemen connected with that institution do; and I shall use my zealous endeavor to promote the feeling of amity. But one point they will be very loth to give up; that they shall, at the same time, have the practical with it, and be furnished for liberal experiments and the fruits thereof; and then shall they return to their school with renewed vigor.

Mr. Laine—How much is there of that park that is fit for such purposes?

Mr. Moulder—Sixty-eight acres.

Mr. Stearns—We have asked for an estimate of the expense for the incoming two years, and the Chairman expressed himself in full accord with the University, and furnished exact figures.

And other remarks addressed to the committee individually.

The meeting then adjourned until Thursday evening.

THURSDAY EVENING, March 12th, 1874.

Present—Senator Keys; Assemblymen Amerman, Canfield, Friedenrich, Meyers, and Tinnin; Regents of the University, Haight and Dwinelle; Secretary pro tem. of the Board of Regents, Mr. Stearns.

TESTIMONY OF WILLIAM SWINTON.

WILLIAM SWINTON, called, sworn, and examined:

Mr. Keys—Mr. Swinton, we propose to examine you under this first resolution. [The first resolution was read.] Now you can go on and make any statements.

Answer—I don't think that I can give any information on the subject at present; it is not in my department.

Question—Do you think, Mr. Swinton, that any allowance can be made, judging from the short time that the University has been organized, the change of location of the University, the situation previous to its removal—might not those things have mitigated against it?

A.—I think it would have weight.

Q.—Do you think the Regents of the University are making due exertions in order to bring about this state of things of the original intention of the organization, or the University?

A.—I don't feel prepared to express any opinion on that subject.

Q.—You have been connected with the institution ever since its organization, have you?

A.—Yes, sir.

Q.—Have you devoted your entire time to it?

A.—No, sir; I have devoted all the time furnished me. I have filled all the hours of the University instruction that our schedule provides, or that I could obtain. It has always been the fight among the professors for more hours than the twenty-four allowed.

Mr. Amerman—Professor, I suppose of course you are familiar with the resolution that has been passed by the Senate and Assembly, under which we are acting?

A.—I have read them to-day.

Q.—The committee were appointed for the purpose of obtaining any information in relation to the specified object set forth in four resolutions relative to the management of the University. So far as the scholastic part of it was concerned, we suppose you are more familiar than with any other portion. We also find with this statement of the Board of Regents, a report from the Faculty of the University. It seems not to have been signed by you, but it is stated that you gave your entire concurrence to it. I suppose you have seen that?

A.—In regard to the last point, I do not suppose it is an especial point. I was not at the Faculty meeting. I did not give my concurrence; on the contrary, there are some points—but they are unimportant; as a matter of fact, I did not give any concurrence.

Q.—So far as this committee are concerned, they want to obtain any information that it is possible to obtain in relation to the management of the University, and with which the Faculty are conversant, without putting any specific questions. I suppose it will be perfectly in order for you to tell whatever you know that will throw light upon this investigation.

A.—I don't think that in that shape I could present my views. The subject is a large one, and a complicated one. I should be pleased to put them on paper, however. I could also answer any specific questions that come under my province. I should prefer that, as I am desirous of going to the office as soon as possible.

Mr. Keys—You would be willing to make your statements upon paper, and then meeting the committee again to-morrow evening?

A.—I think I should be hardly able to make any satisfactory presentation in that length of time.

Q.—Well, you can select your own time; say two days, or three—Monday evening or Friday evening?

A.—I should prefer to respond to any questions that the committee might ask, if that course can be pursued.

Mr. Meyers—In what departments have you been teaching?

A.—My chair has been in English language—English literature and general history; covering, however, a variety of subjects, such as logic, rhetoric.

Q.—Well, were you not connected with the University, then, in any such way that you would be necessarily familiar with the general management of it?

A.—So far as a member of the Faculty may be supposed to be familiar with the general management. I was a member of the Academic Senate. I generally knew all the business brought before the Senate, which would be apt to include the questions of the organization; at least, used to.

Mr. Keys—Would you go on and tell us any particulars in which you disagreed with the Faculty, in the statement embodied in this report?

A.—I have never disagreed at all, with the exception—there might have been other things in it; I should object to the use of the term College of Agriculture, as it does not conform to our last official statement of the organization of the University; we have no such a thing; it was, merely, as I mentioned before, it was a small technical matter.

Q.—Well, have the relations always been cordial between you, as a professor, and the Board of Regents?

A.—Entirely so.

Q.—Do you think that the Board of Regents have always manifested a disposition to do the best they could with the means at their disposal?

A.—So far as their lights went, I think so.

Q.—As what?

A.—As their lights.

Mr. Friedenrich—In what way was it deficient?

A.—I think that many members of the Board of Regents are too much absorbed in other duties, to be prepared to deal with a good many questions affecting the University.

Q.—What matters? tell us one; give us a detailed statement of any matters you think they were deficient in?

A.—I would say, in general, that it is not to be supposed—I cannot think they have time to deal with all the technical details of the University.

Q.—Not to speak of technical matters now, have they fallen short of their duty?

A.—I don't say that they have fallen short.

Mr. Meyers—Well, I would understand you then, like this; that they are absorbed with their business, their time was so taken away that they could not give such attention that perhaps ought to be given it; or that if they did give it, they did not perhaps act as well as they might if they had devoted more time to it?

A.—Yes, sir; I should say they would.

Q.—Would not the same objections be likely to lie to any other set of Regents that might be put in their place; have not other men also similar duties to attend to, or, unless the compensation were connected with the duties of the Regents?

A.—The analogy seems to be very much like that of representatives in the Legislature; I have no doubt that we might select from one quarter of the State men who would do better. The theory is that different parts of the State are represented, that men are actuated by different interests, especially in large cities.

Mr. Keys—Would you consider it necessary, Mr. Swinton, for a gentlemen to do his duty as a Regent, that he should devote his whole time and attention?

A.—No, sir.

Mr. Friedenrich—As I understand it, Mr. Swinton, the Board of Regents have failed to do their duty—their entire duty?

A.—I have not made any such statement.

Q.—Well, they have not devoted, as I understand you, their time and attention to the University; and for that reason some things have been neglected?

A.—I have not made any such statement.

Q.—What was it then?

A.—I replied to the question of the Chairman that in my opinion, so far as their information went, they acted for the best interests of the University.

Q.—Do you think they had all the light that was requisite and necessary to enable them to manage it properly?

A.—I have already answered that question, so far as I can; it is of a very general nature.

Q.—Are you fully satisfied with the management of the Regents?

A.—I scarcely know how to reply to the question.

Q.—Do you think that they have done the best that it was possible for them, under the circumstances?

A.—I don't know anything to the contrary.

Q.—You have been connected with the institution for how long?

A.—Since its organization.

Q.—Perfectly familiar with its workings—its operations?

A.—All my relations, as a professor, to the Regents, were very slight; I have had no official relations to them, only as being elected.

Q.—You are no longer connected with the institution?

A.—No, sir.

Q.—Since how long?

A.—I think my resignation was accepted on the third of March, perhaps.

Q.—This last first of March?

A.—Yes, sir; last week, I think.

Q.—You voluntarily resigned?

A.—I did.

Q.—And had no difficulty with the Board of Regents?

A.—None in the world; the most pleasant relations.

Q.—Not with the President of the institution?

A.—Not at all.

Q.—With any other professor?

A.—On the contrary, terms of most cordial friendship.

Q.—What was the reason of your resigning?

A.—That was a matter—simply a business matter. I entered into a contract five years ago with a publishing house in New York— I had business in New York which imperatively called me there.

Q.—Hadn't you asked for a leave of absence?

A.—I did, for a period.

Q.—How long?

A.—Until the end of the scholastic year. I put it as short as I could, wishing to get as large a margin as possible.

Q.—When would the scholastic year end?

A.—The twentieth of July.

Q.—That would be—March, April, May, June, July—about five months?

A.—Yes, sir. They gave me six months two years ago.

Q.—You first asked for leave of absence?

A.—Yes, sir.

Q.—How was that received by the Regents—what did they do upon that?

A.—I believe they unanimously declined to grant it, in the present state of affairs in the University.

Q.—And thereupon you resigned?

A.—No, sir; I reapplied, at the request of the Faculty.

Q.—Reapplied for the leave of absence?

A.—Yes, sir.

Q.—So they took it twice under consideration?

A.—Yes, sir.

Q.—The Regents still refused to grant you leave of absence?

A.—Their refusal of acceptance the second time would indicate that they did not grant me leave.

Mr. Dwinelle—It came in the form of a resignation the second time, did it not?

A.—Yes, sir.

Mr. Tinnin—You have been asked several questions in regard to the attention of the Board of Regents; do you not think that they have attended to their duties as closely as any other body of men equally as competent would have done without pay.

A.—I have no doubt of it in the world. I know very little about the Board of Regents. My duties have been entirely in the interior of the University. My knowledge of their action is the same as that of the public. I read what is printed in the newspapers.

Q.—In regard to compensation; men don't very often work in this country without pay?

A.—They often do. The laborer is worthy of his hire.

Mr. Keys—What do you think of the school, professor; is it in a prosperous condition; in a condition for which it deserves well of the State and of the people?

A.—I think it has been doing admirable work in many respects; as good strictly college work as is done anywhere I know of.

Mr. Tinnin—What did I understand was your objection to the report as to the term agricultural?

A.—Simply that it does not conform with the official statement of the organization of the University, as last stated.

Mr. Meyers—Well, don't you think that "Agricultural College" is really a misnomer; that it don't represent the idea that it carries out, as is indicated in the education. I believe the terms are the teaching of subjects or sciences related to agriculture?

A.—I don't think that the present special course in the College of Science is a curriculum of the college.

Mr. Friedenrich—In what way does it lack being an Agricultural College; what other branches would you introduce?

A.—I am not at present prepared to say; my impression is a general one, founded from examining curricula of other Agricultural Colleges, and there are many studies pertinent to the curriculum of colleges not taught there.

Q.—Can you name those studies?

A.—I cannot just now. I could very easily put them on paper, by reference; I have not sifted the matter with sufficient attention to be able to call off the schedule of subjects. The number of subjects, however, as stated in our present catalogue, I have understood is larger than is actually taught. Veterinary Surgeon is mentioned as one. I don't know that it is specially important to a course in Agriculture. There are numbers that are put down as ideals to be taught, that are not taught.

Q.—Can you name any other one that you could think of, that ought, in your judgment, to be taught, that are not?

A.—I think if I had a catalogue I could recall them.

Mr. Meyers—Is there any call to provide a professor, so long as it is not called, so long as there are no students there that wish to study that?

A.—I suppose that when an agricultural college organizes the professors are found, and the students are expected to come. On that subject, however, my information would be very slight, and my opinion of no kind of value.

Mr. Freidenrich—Have you any complaints to make, of any kind or character, either about the Regents or about the Faculty; can you suggest to us any remedies for anything that is not now being done—any improvement, any different course of study?

A.—It would depend very much on what the aim of the University was; if it was economy, one line of action would be pursued; if it were enlarging the institution without reference to economy, another course might be pursued.

Q.—That would depend upon the means at the command of the Regents?

A.—Yes, sir. As a means of economy, I should say that the abolition of the office of President would be a desirable measure.

Mr. Keys—What else—anything else?

A.—I am not prepared to recommend any plan for the organization, or reorganization, of the University. Mr. Chairman, I would be happy to respond to individual questions, as I said before.

Mr. Meyers—With regard to the office of President; don't other institutions of similar character have a President?

A.—Most of the New England colleges do have a President, I believe; every college must have an executive officer, I suppose.

Q.—Do they not in every one of the States?

A.—I think they do in almost all the colleges.

Mr. Friedenrich—Can you mention any college that don't have a President?

A.—Yes, sir; the University of Virginia.

Mr. Keys—Well, what is the difference?

A.—The difference is this: the President is elected by the Board of Regents, the Chairman is elected by the Faculty; he is elected every year and is responsible to the Faculty, and is in the position of Prime Minister, perhaps, and may be passed on as a matter of confidence, or want of confidence.

Mr. Meyers—The President, he, as it were, represents the Regents?

A.—I think he does, sir.

Mr. Friedenrich—In what respect do the duties of the officer elected by the Faculty, differ from that of the President elected by the Board of Regents?

A.—I presume the duties of President are very much what the President chooses to make.

Q.—Well, in the practical operation of the two offices, wherein lies the difference?

A.—That one is elected by the Faculty and the other by the Board of Regents, as I said before. The chief duty of the latter is drumming around and getting money.

Q.—Is that all?

A.—That is one of the chief duties.

Q.—Is there any other?

A.—Most undoubtedly, as Chairman of the Faculty he is the executive head of the institution, takes a paternal care over the student, and is a sort of father.

Q.—And what is the duty of the executive officer elected by the Faculty?

A.—I presume simply to bring the Faculty in contact with the public intention.

Q.—It is not his duty to drum round and get money?

A.—It is not my idea that it is the duty of the President of a State University.

Q.—Is that the only difference that you can state to us?

A.—The difference in point of theory and point of fact. I don't care to state any other differences. I never have been President; my views are very general on the matter.

Q.—What are your relations towards President Gilman?

A.—They have always been those of civility.

Q.—And stopped there, did it?

A.—That would be the manifestations of my relations; but you are not inquiring of my interior feeling.

Q.—What are your feelings towards him at this time?

A.—I think he is not as good a President as the University of California deserves.

Q.—Can you give us any reasons for that?

A.—I will. I think that he has put the Board of Regents and the University in a sort of tacit attitude of antagonism to the wishes of the people of the State in regard to education, and has seemed to commit the Board to a position of antagonism with the wishes of the people of the State with regard to education.

Q.—In what way?

A.—Rather by inference and implication, than by direct statement, namely: conveying and giving the impression that the people, who are desiring, I think perhaps passionately longing for it, a practical education, are mistaken in their wish; that their wish is more or less a delusion, and that their wish has been tested elsewhere, and perhaps has failed.

Q.—And where has it failed?

A.—That is one point. Another point is that I don't think that there is that feeling of confidence on the part of students towards him that is necessary for the successful working of the University for any length of time.

Q.—Have you heard any complaints on the part of the students?

A.—Any number of them.

Q.—Voluntarily made by them?

A.—Voluntarily made by them.

Q.—To you?

A.—To me.

Mr. Keys—Don't you think sometimes that students have complaints without just cause?

A.—Yes, sir; frequently. I don't think, however, that the great body of the students ever do, especially young men and young women that are as sensible and intelligent as are our students. I think when you find the great majority going in one way, and that not as a temporary effervescence, but as a conviction, they are very apt to be right.

Mr. Friedenrich—Does that appear to be the sentiment of all the students?

A.—It is, so far as I have come in contact with them.

Q.—Have you had frequent conversations with them?

A.—I have since my resignation. Many have—large numbers. I have not met them as a body.

Q.—Have you conveyed your idea on the subject?

A.—I have not.

Q.—Never expressed your feelings to them?

A.—I have not. These statements were simply voluntary on their part.

Q.—How did they come to make these statements, Mr. Swinton?

A.—I presume they must have divined that things were not very comfortable and pleasant. People have a way of getting at things by various avenues, through impressions, and when they have, then they express them.

Q.—How did they come to express their impressions to you; they knew nothing of your feelings, did they?

A.—I think it probably arose from the fact that they were apprised that I had spoken for a leave of absence, and that it had been rejected, and perhaps there was a feeling of disappointment that it had not been granted. I think there was a very general feeling of that kind.

Q.—How would President Gilman be connected with that? That was the action of the Board of Regents, was it not?

A.—Yes, sir. By using influence in the Board to prevent its being granted.

Mr. Meyers—That would go to show that they were disappointed that you were not going away?

A.—Yes, sir. I think they would have been glad to have me going away, and staying a few months. Their actual feeling is pretty well stated in a resolution.

Mr. Friedenrich—You attribute it to the influence of President Gilman, do you not?

A.—I do.

Q.—You think that if he had not interfered in the matter, leave would have been granted?

A.—I don't regard that as especially important. It was absolutely necessary for me to be in New York, so that I have no feeling in this matter.

Q.—Have you conveyed your feeling on this matter—have you conveyed your feeling to any other persons besides to students?

A.—I did not say to students—have conversed freely with individuals.

Q.—Have you communicated them by letter?

A.—I have talked quite freely about it.

Q.—Have you ever communicated it to the press?

A.—No, sir.

Q.—Either directly or indirectly; either in the State or elsewhere?

A.—No, sir; neither directly nor indirectly, my feeling towards him now.

Q.—Have you in any communication reflected upon the management of the President?

A.—Never.

Q.—How long have you entertained these feelings towards the President?

A.—It is very difficult for me or anybody else to state the genesis of feeling. I never had a very high regard for his fitness for the position. I did not entertain it from what I heard before he came here; my observation did not increase my respect for his fitness; that feeling has been growing ever since.

Q.—Can you state to us any dereliction of duty upon his part?

A.—I cannot.

Mr. Keys—Was you ever an aspirant for that position?

A.—Never, for an instant—would not accept it for the increased salary of the President of the United States.

Q.—Did you have a friend or a candidate who you thought was better qualified than Mr. Gilman?

A.—No, sir; cannot say that I ever had—never occupied myself much with the matter of the presidency—it was not a question that I ever had any occasion to consider.

Mr. Friedenrich—In what way or manner do you believe that the Board of Regents was acting under the influence of President Gilman, or not fully according to the wishes of the people, in the establishment and management of the agricultural grounds of the University?

A.—I am not fully prepared to reply to that question; it is out of my province.

The following expression of sentiment, upon the resignation of the Professor, by the students of the University, was read:

Whereas, Necessities have required Professor William Swinton to resign the Chair of English Literature and History, in the University of California; therefore

Resolved, That we, students of the University, hereby express our sense of great loss, and our utmost regret in losing, in him, at once the profound scholar and the congenial friend.

Resolved, That in him we recognise the wise counselor and abiding friend; that to his learning we bow in respect; for his friendship we give him ours, and that in the future we wish him all happiness; our friendship and best regards will make their journey with him across the continent, and take up their home in his.

W. R. DAVIS,
L. S. BURCHARD, } Committee.
J. E. BUDD,

University of California, March 9th, 1874.

Mr. Dwinelle—Did you solicit being subpœnaed as a witness?

A.—I did not.

Q.—Neither directly or indirectly?

A.—I did not solicit; I have said, two or three times, that I would be very glad to testify on my way.

Q.—After you resigned?

A.—Yes, sir.

Q.—How many times have you had leave of absence?

A.—Once. I think it commenced in November, eighteen hundred and seventy-one, and ran to May, eighteen hundred and seventy-two.

Q.—Did you return at the time that was stipulated?

A.—I did.

Q.—You were engaged in publishing a series of books, were you not?

A.—Yes, sir; at the houses of Blake & Irwin and Harper Bros.

Q.—Can you tell us how many books you have published?

A.—I can hardly say; they are numerous; I think, ten or a dozen; I think ten.

Q.—Did you generally put upon the pages of your books the words "Professor of the University of California?"

A.—I think, generally, that "Professor of California University" is on the text books; that is arranged by the proof reader.

Q.—Do you not know that for three or four years past there has been a sentiment in the Board of Regents that you have been neglecting your duties?

A.—I have heard one of the Regents declare, that he was "devilish glad that we had a man who could write books."

Q.—Are you a University bred man?

A.—I am not.

Q.—Have you been in the habit of talking over with Professor Carr the deficiencies in the University?

A.—We compared notes frequently, as a matter of course.

Q.—Now, these complaints of President Gilman; did you hear of them before you resigned—complaints on the part of the students?

A.—I have heard complaints from the students themselves.

Q.—And received them?

A.—I heard them—could not help hearing them.

Q.—You heard them?

A.—Yes, sir.

TESTIMONY OF PROFESSOR CARR.

Professor Carr, called, sworn, and examined:

Mr. Keys—Now, Mr. Carr, you have heard the resolutions under which we are acting; you will first state to the committee how long you have been connected with the University of California?

Answer—Since its organization.

Question—Well, now, you will go on and make any statements you may deem proper, connected with the resolutions under which we are acting?

A.—I don't recollect what the resolutions are, Mr. Chairman.

Q.—You will confine your remarks to the first resolution, which reads: "First—What instruction has been given in the mechanic arts in the University of California; whether the same has been defective or not; and if defective, wherein such defects consist, and what is the cause, as well as the remedy of such defects."

A.—I think, Mr Chairman, that is answered pretty fully in the letter that is in the printed reply.

Q.—Will you please read it?

A.—This letter was in reply to a letter from the Regents, covering the space—essentially the same ground.

[See letter, or "Response from the Professor of Agriculture."

I regard something of that sort as important to fill out the in-door instruction. That covers, I believe, essentially the same ground of what I am doing in the way of instruction in agriculture, and what seemed to me to be important as soon as is practical to have carried out. I would say in this connection to that, under the resolution of the Board of Regents, which is appended to this printed document, at the last end. I have been occupied a portion of my time during the session of the University, giving there on an average, say, five lectures a week, during four days; and then being elsewhere in the State, giving lectures and something of that sort, and my vacations, for the last four years, have been generally occupied in that way, so that the amount of instruction is covered by the statements there, together with what I have been doing in outside work. I think, if one such special provision can be provided for, we shall compare very favorably with any Agricultural College, perhaps, in the country, so far as in-door instruction. Then, another improvement, that it seemed to me to be provided for as early as practicable, is—and that is referred to in documents, or there is reference to books containing this—is that as early as practicable there should be out-door experimental operations carried on, and upon the University grounds, so far at least as demonstrating the principles which are taught indoors, and so far as demonstrating the capacity of our soil and climate here in California, or agricultural produce of every description, either of the farm, or of the forest, or the orchard, making, and in view of what is known in Europe as an "Agricultural Station," perhaps, combining a little more with reference to having experimental operations carried on illustrating the history of every plant that is useful, that can be grown or acclimated upon this coast, experiments in reference to forest culture, so that we could determine the best methods of covering our naked hills, which are being deforested, with trees, and carrying out all things of that sort—many other things of that sort—in an experimental way. I am free to say, that so far as these things are concerned, it does not. They do not necessarily require a very great amount of ground. An experiment, with regard to any particular crop, may be made upon a square yard, or upon a small area, perhaps, as well as upon a number of acres. Indeed, the circumstances, that a small spot of ground, where you weigh the sunshine, so to speak, the heat, and the light, and moisture, to determine the character of the soil, and all circumstances connected with that experiment, would be better controlled than with a large field. It has seemed to me that as soon as practicable, it would be very desirable to carry out that feature of the institution, which would be valuable to the students, in learning them how to observe these things, and at the same time valuable to the people of the State; having experiments of this sort published every year would be valuable to them; and having at the same time, so far as practicable, similar experiments, or intelligent men in different parts of the State making some experiment of a similar nature, in regard to these things, under different conditions, so that we could bring out each year results of some value, and by continuing them on year by year, get at some results which would be valuable, so far as California agriculture is concerned.

Mr. Keys—Well, Mr. Carr, have the Regents manifested a disposition to place at your disposal the means within their power, with the intention of making the agricultural and mechanical branch of the instruction the original and permanent feature of the institution? have they given you all the facilities they could?

A.—Well, I can hardly answer that. I suppose that every man that is connected with the institution thinks his own department more important than any other, and perhaps I magnify mine in that direction. I don't know but everything has been done in that direction. I should like, of course, to have the institution carry out these things.

Q.—Are you not now in the condition to better carry out those experiments?

A.—Yes, sir. We are on the grounds now. I should have liked the means to have done something more in former years, but of course being on the grounds we can perhaps do more efficiently than we could in being five miles away.

Mr. Amerman—You of course have seen the memorial of the State Grange?

A.—Yes, sir; well, I cannot say that I have seen the complete memorial. I have seen what has been published in the newspapers.

Q.—I believe it is charged, so far as the Agricultural College is concerned, in that memorial—if not in that, in the columns of certain newspapers in the State—that the Regents of the University have not offered the Professors of Agriculture the facilities which they might have afforded them. So far as your knowledge goes, have or have not the Regents afforded you, as Professor of Agriculture, all the means at their command?

A.—I know nothing to the contrary. Certainly, I know we could have done a great deal more in every direction, if there had been more means.

Q.—Then you don't attribute the fault to the Regents, but simply to the lack of funds for carrying out the experiments?

A.—I think that is the principal difficulty. If the Legislature would give us funds, we could make, I think, a very respectable showing in a few years.

Q.—Have the Regents ever manifested any disposition or intention of thwarting you in any of your desires for practical experiments in your branch of the University—the particular branch of which you have charge?

A.—I don't know that they have. Of course I have been urging these things with a good deal of persistency. They have not had the means, I suppose. It was my business to present the thing in as strong a light as I could—that may be needed.

Mr. Meyers—Don't you think they have been doing well, considering the means they have?

A.—A good deal has been done in the institution, most certainly, and perhaps everything that could have been done. I am not prepared to say but what it has, by no means. I only say I wish we had means, so that we could do more.

Mr. Dwinelle—Professor Carr, was not an appropriation made two years ago, that you thought was needed?

A.—You refer to the action with reference to the garden?

Q.—Yes, sir. I think we made an appropriation for a forcing-house. I am not accurate in regard to figures.

A.—As I understand it, this was about the situation: at the time these appropriations were made, the grounds had not been surveyed, and in conversing about it, at the time, with President Gilman, and we thought it would not be desirable to commence on anything of a permanent character until we got out there. We might, of course, have made some commencement.

Q.—The appropriation was used in that direction?

A.—No, sir; it was not. I will explain in regard to that: there was an appropriation made for a green-house, and I was also authorized to employ a gardener, not to exceed one hundred dollars a month. This appropriation was made, I think, two years ago; for the green-house a year ago last Fall. Owing to the fact that the grounds were not located correctly, and so on, the thing went along, and in the Winter, Mr. Nolan made a donation of duplicates of all that he had, and it seemed very desirable to have those put in the grounds at that time.

Q.—Plant some trees?

A.—Yes, sir; and the Board made a special appropriation, and I put them in as nearly as I could; the grounds had not been laid out. I then made out a plan for a green-house. Mr. Powers, who was at work on the buildings, should contract for the glass, and I expect it was brought out there in the Spring. Owing to delay in the surveys, and things of that sort, there was nothing further done; and I think about the time Mr. Powers went away he got the pay for the present contract, which was spent; and I will explain in that connection, too, that it seems that when the two hundred dollars was paid that had been expended in that way, or the warrant for the full amount of five hundred dollars was drawn up, I indorsed on that the two hundred dollars; and here in January—perhaps a month or so ago—I was in Mr. Moulder's office, at his request, and he said the warrants had been drawn to the full amount, and he had drawn the check for the balance, payable to my order, and thought it best for me to take it; and when the work was done, to present the balance of the account of it.

Mr. Dwinelle—That has been expended?

A.—Two hundred dollars.

Q.—But the balance not?

A.—But the balance not.

Q.—You used the phrase "agricultural station?" Don't that indicate the progress in these Agricultural Colleges to the effect, that it is better to have certain "agricultural stations," rather than one large experimental farm?

A.—Oh, yes; I think decidedly so. I should think the idea at the present time in regard to a large farm, at least what is called a "model farm," is being very much modified from what it was years ago. The idea now is, that an experimental farm, which may be quite a small one, and at the same time, in connection with what are called Agricultural Colleges, to have places of observation, or agricultural stations, in different places, where certain things are experimented upon.

Q.—Now, is not the climatology next the bay—next to the Alameda coast—is not that rather peculiar? It is moist, is it not? Would not the climatology vary from it at Livermore?

A.—Yes, sir.

Q.—Your information, after all, is to have stations, a dozen of stations, rather than one large experimental farm?

A.—I should never, under any circumstances, advise a large experimental farm. We have grounds enough there, when we get at them, to use them for all these experimental purposes, and I think the grounds are very happily situated in regard to exposures of the different grades; the lower part of our grounds particularly, and in regard to variety of soils; so that we can really do a great many things in that single locality that could not, perhaps, be done elsewhere. We have a condition, perhaps, approximating that of Los Angeles.

Q.—Is not this the case, that in a great many Agricultural Colleges the students live in clubs and rely upon the produce of the farm?

A.—That was formerly regarded an essential feature.

Q.—They are getting out of that?

A.—Yes; I think that is being modified very much. It is the theory now, or so much of the practice, as would give them skill and observation. Those are the essential things, wherever there are means, etc. There might be, of course, larger farms, and those things carried on.

Mr. Amerman—Will you state to the committee if there are any practical experiments in agriculture now under your control and being carried out at the University; and if so, what they are?

A.—No, sir; there are none, *i. e.*, of these experiments. I mean of soil and of grains. I mean of soil and of grains, my instruction, a large part of it is experimental, my instruction in agriculture, chemistry, and so on. I teach those things experimentally, as far as it is practicable; but for reasons, which have already been given, the grounds are not in a condition where we can carry out work of that sort. There are certain classes of experiments where we want to arrive at certain scientific truths, which we may carry on upon a very limited scale, but the leading idea which I have in regard to those things is not so much the discovery of new principles as in the application of those we already know. A man could, perhaps, very profitably to science, and perhaps practical agriculture, spend his whole time in purely scientific investigations, researches, as is done largely in some of the eastern institutions. There is the Buzzey School of Agriculture, where the professors are engaged now almost exclusively in purely scientific investigations. They have but very few students connected with it, and they are engaged—spend their time in scientific researches in matters connected with agriculture and horticulture. They are of course exceedingly valuable.

Mr. Keys—How many scholars have you in your classes?

A.—I am giving instruction now to more than one class—there is six in one class and two in the other—that are in the purely agricultural matters. Then I am giving instructions, so far as life and hygiene are concerned, to the entire Freshman class. It is something like the number of fifty. I don't know how many there are in the lower classes that design to pursue agricultural studies. Perhaps I should explain— don't know but what it has already been explained—that in our plan the special studies of agriculture don't commence until the commencement of the third year. The whole course of instruction given in the University covers a period of four years. The first two years include a general education—what could be considered, perhaps, a part of a liberal education, say for the farmer or for any one that is going to engage in industrial callings—while the last two years there is where these practical matters come in—agricultural, those that are in that direction, and engineering, those that are going in the other direction; so that we cannot tell until we get up to the third year who will branch off into this, or what one of the special courses he will take—whether they will diverge, in particular, into the specialty, say of the agricultural, or of engineering, or of mining, or of whatever else there may be.

Q.—How many in the two lower classes?

A.—I don't know. There is no instruction given in agriculture. I would like to state in this connection that I think that if we had means to go on and develop these things in the way that has been indicated, that our number of special students in agriculture would be largely increased. I have been around the State a good deal, and I think there is a growing feeling of a want of that kind of education—perhaps not so great as it should be—and that when an institution has the means of carrying those things out, that we shall not want for students in these things.

Mr. Keys — When traveling through the country do you find the yeomanry friendly to the institution—do they have faith in it?

A.—I have never found anything to the contrary. I have taken always particular pains to explain the nature and objects of the institution. In the first place it is open to all persons of both sexes, and provision is made for a liberal culture—say of a classical culture; for those that want to pursue that, general scientific culture; and as fast as it can be done it is expected that provisions of law will be made more especially in these industrial pursuits, such as farming. I, of course, refer more particularly to the future, explaining with more illustration the leading features which I have presented this evening. I have not yet met with a person who expressed anything but the most decided approbation. I don't know but there may be persons.

Mr. Keys—Do you think the Board of Regents are doing the best they can to carry out the intentions of the foundation?

A.—I know nothing to the contrary.

Q.—Are the feelings between you and them cordial?

A.—So far as I know.

Q.—Well, do you anticipate now, since your removal now, to enlarge your experiments?

A.—I expect so; I expect the Legislature this Winter to make such appropriation that we can go on and carry out the ideas.

Mr. Amerman—It has been charged that the University were not carrying out the ideas expressed in the organic Act, so far as agriculture is concerned; will you state to the committee what your ideas are on that subject, or what would be necessary to be done in order to carry it out to the fullest practical extent?

A.—I think the main thing in regard to that, as it is in almost everything else, is money, as a means. Of course, these things cannot be carried out without means. We want the grounds to be put in order; we want means for some building in connection with that, and then have some skilled persons, so far as gardening and things of that sort, to carry on these experimental operations; and means to provide for certain skilled instruction, such as I have already alluded to; and I would like to press that point a little further. My instruction, of course, covers a broad field, and has to be necessarily quite general in its character. I do not suppose that any man can be supposed to know everything about every branch of agriculture, in all of its details. What my idea has been, as expressed, I believe, in that communication, was to have, say at certain times during the year, to be arranged when it would be most convenient, to get, say some person that is specially skilled in certain practical matters, to come there and tell us what his experiences are about these practical matters. Here is a man in the State that is accustomed and has a good deal of experience, say in the matter of dairying, where the conditions are a little different from what they are at the East; he has worked that out very well, it may be. Now, if we could get him to come and tell our students in agriculture his experience, in two or three talks, familiar talks, we should get information that we could not get in any other way. And then some one that is specially skilled and has been very successful, say in grape culture, or something of that sort, and, perhaps, in stock raising; and, perhaps, in silk culture, and a few of those things. I don't mean, of course, any extended course of instruction, but to have a limited course of instruction. Then there is another thing. We are not troubled much with insects, but we want some person to give us some instruction, so as to be enabled to avoid the difficulty which is certain to come some time on this coast. And so in regard to many other things. And then, in addition to that, and, perhaps, in connection with it, a favorite idea of mine has been, to have, some time during the year, a sort of what you might call a Farmers' Institute, where we could get those men together that are engaged in those different things, and have a programme laid out, so that all the students could be benefited by it, and all the farmers, or any one else choosing to come, could be benefited by it, extending through one week, or two, as the case might be, standing in the same relation to agriculturists as the Institutes are to teachers.

Q.—How long have you been at Berkeley?

A.—About six months; went out there in September last.

Q.—Has it been possible, since you have occupied those grounds at Berkeley, for the Regents to have done more in carrying out the practical ideas of agriculture?

A.—I don't know that there has been. I should say I should like very much if they could have done more. I cannot say—very likely I might feel—that more should be done in my own interest than in another's, and perhaps other members might feel the same.

Mr. Dwinelle—Is not the experimental season beginning just now?

A.—It is getting rather late to commence this year for anything more than what would be preparatory.

Q.—You have water?

A.—Yes, sir. The water is not distributed over the grounds.

Q.—Well, professor, don't you regard laboratory instruction as practical agriculture?

A.—Oh, yes; that is, in one sense it is practical; certainly.

Q.—The observation of a parasitic plant would be very practical—a fungus growth upon a sickly plant—that is all practical?

A.—Yes, sir; the studying of the habits of an insect; getting acquainted with the methods of getting at these things. In the first place, I think it is a great idea to learn students how to study or how to observe.

Q.—The habit of scientific thought and observation, you regard that as practical?

A.—It is practical, perhaps; it is something leading to the practical.

Q.—You don't regard that merely as abstract or scientific?

A.—Oh, no; of course, theory is one thing, and the application is another.

Mr. Amerman—There has been a good many foolish charges made; among others, so far as you are concerned, is that there has been the charge made that the Board of Regents failed to provide you, as Professor of Agriculture, sufficient and commodious accommodations in the building, and that in consequence thereof you were very much dissatisfied thereupon, and created a great deal of complaint at the action of the Board of Regents in placing you where I believe you are now, on the basement.

A.—Do you speak of these as charges?

Q.—Those charges have been made against the Regents.

A.—Well, perhaps that would require some explanation that the Board could give, or the President, better than myself. I, of course, should like better accommodations than there are, but as I have frequently expressed to individuals, I can get along with most anything, when it is necessary. The accommodations are necessarily more or less limited, in accordance with the designs of the building, that we have. The rooms that were first assigned to the Department of Agriculture—especially rooms for putting in collections—was on the first floor. It was thought, I believe, by the Board, or by the Advisory Committee, that it was necessary to use these apartments for the library, and the present apartments, or at least those underneath, were used. Of course it would be much more desirable if we had rooms that were more convenient on some accounts, especially with reference to light and qualifying things of that sort.

Mr. Amerman—Are not the rooms that you at present occupy amply commodious?

A.—They answer very well for many things. There is a practical difficulty about them. This want of light in very many things in conducting in-door experiments of a certain character, in horticultural and plants, in-doors, and so on. For any illustration it would be very desirable if we had more light to use for that purpose; and then if we had, of course, a more commodious hall for exercises, and had the means to get such illustrations, and so on, as would make one attractive Agricultural Museum, it would, of course, add a great deal more to the interest of that part of the institution.

Mr. Amerman—You will excuse me for asking you a question; it may seem to be very pointed and direct. Have you any cause of complaint to make against the Board of Regents of the University, or the President?

A.—I don't know that I have. I think I have complained more to them than I have to any one else in the last four years, in urging certain things.

Mr. Dwinelle—That is, in the direction of agricultural improvement?

A.—Yes; I spoke in regard to the general conduct of the University.

Mr. Keys—Have the Universities with which you have been formerly connected been governed by the President, connected with the Regents, or by a special officer?

A.—Those that I have been connected with were governed by the President, in the usual way, connected with the Regents.

Q.—Do you think it would contribute any more to the usefulness of the institution if the professors were to elect the executive officer than if the Regents were to elect him?

A.—As a mere matter of economy, I think, in the University of Virginia, the professor who is elected has no increase of salary. That, so far as I know, is the only institution in this country.

Mr. Friedenrich—Have you, at any time, asked of the Board an appropriation for a specific object, which they have refused to grant?

A.—I don't know that I ever did. I am not certain of that, though. I think, in some of my communications, I have suggested, in carrying out some things, that a certain amount would be required. I am not certain. I am rather inclined to the opinion, that before the appropriation was made, say for the green house—I could tell by reference to the communication—I know that I sent a communication urging the improvement; at least, in my opinion, of commencing some experimental work, and of putting up the green-house.

Q.—Was a sum mentioned?

A.—I think I did mention a particular sum; that is my impression.

Mr. Meyers—Would not those who have made a profession of agriculture, or made those studies a specialty on such subjects as experimental farms and gardens, and everything of that kind—is it not your opinion that, supposing that those who have made a specialty should meet together in council, would they not disagree very considerably in what was desirable to do outside of the lecture room?

A.—Oh, that might be; but the idea would be to get at the experience of each one in regard to those things, as with farmers' clubs, and organizations of that kind, in a sort of interest, that I speak of, so that each one would be benefited by the experience of all.

Q.—So far as architectural farming or horticulture is concerned, does not that, of itself, demonstrate that your whole matter is in a very great degree experimental?

A.—Yes, sir; certainly. That I think is just what we want to work out just as fast as we can; we can get at information so that we can approximate something perfect. It seems to me, that with agriculture and horticulture, the best thing is experiment.

Q.—We are, then, at the present time, mere learners?

A.—Yes, sir; suppose that every man is a farmer. We want each student to take a share, so that they will know how to get this information; for, after all, this information, as a matter of what we call the school education, is little more than a preparation for a young man to begin to educate himself.

Mr. Haight—The room that is occupied by you has the laboratory arrangements in it; has not the one—was it not the one that has the conveniencies for experimenting in agriculture and chemistry?

A.—Well, all of the basement rooms, indeed, all of the end rooms, were built with flumes with reference to experiments. That room was finished up so as to have flumes; the rooms for experimental and analytical chemistry were on the other end of the building; the rooms above are assigned for the analytical work. The relations of chemistry to agriculture are taught by Professor Rising, in what is called analytical chemistry.

Q.—What is the size of that?

A.—I don't know the size. The difficulty with the rooms in the basement is, that we don't get the sunlight, and the room being low, that is the principal defect in it. It could be used more advantageously if we had a large hall, and that could be used more advantageously for metallurgical purposes—for things of that sort. I think the Regency plan was for that object, for the metallurgical room. It could be used better for things of that sort; where you want a light to display things of that sort.

STATEMENTS OF THE REGENTS.

MEMORIAL OF THE BOARD OF REGENTS

TO THE LEGISLATURE

REQUESTING AN INVESTIGATION.

To the honorable the Legislature of the State of California, represented in Senate and Assembly:

The memorial of the Regents of the State of California respectfully represents:

That for nearly six years, since the organization of the University in June, eighteen hundred and sixty-eight, they have administered the educational and financial affairs of the University, always under circumstances of great difficulty, but with some success, as witness the present condition of the University, with two hundred students and twenty instructors in its various departments.

Your memorialists feel confident that their labors in aid of the education of the youth of California will be better appreciated by the public authorities, as well as by the mass of the people, with thorough information upon the whole subject.

It seems at present to be supposed, and very erroneously, as the Regents think, that there have been:

First—Some deficiencies which could have been avoided in the teaching in the departments of agriculture and mechanics in the University.

Second—That some errors have been committed in the management of the agricultural grant made to the State by Congress for the endowment of the University.

Third—That the Regents have not shown due economy in using the funds which the Legislature has appropriated for the University.

The Regents of the University therefore respectfully ask of the honorable the Legislature, that it will, in the exercise of its legitimate authority, create a joint committee of the Senate and Assembly, with full power to send for persons and papers, to inquire and report to your honorable bodies:

I. What instruction has been given in agriculture in the University of California; whether the same has been defective or not; and if defective, wherein such defect has consisted, and what is the cause as well as the remedy of such defect.

II. What has been the management, by the Regents of the University of California, of the one hundred and fifty thousand acres of agricultural lands donated by Congress to the State of California for the use of the University; whether the same has been defective or not; and if defective, wherein such defect has consisted, and what is the cause as well as the remedy of such defects.

III. Whether or not the Regents have properly administered the funds of the University which have been intrusted to them; and if not, in what particulars.

The Regents of the University respectfully represent to the honorable the Legislature, that such examination, made as above indicated, would tend to promote the interests of the University, from the establishment of which so much benefit has been justly expected to flow to the whole people of the State, and especially to the great majority who desire a complete education for their children, but are not able or willing to send them to distant cities for this purpose.

While we have indicated a joint committee of each House as the one which we would prefer, we shall be satisfied with any other efficient method of inquiry.

H. H. HAIGHT,
Chairman Committee of Board of Regents.

J. WEST MARTIN,
Secretary pro tem.

Dated, February 17th, 1874.

RESOLUTION

OF THE

SENATE AND ASSEMBLY INQUIRING INTO THE AFFAIRS OF THE UNIVERSITY OF CALIFORNIA.

Resolved by the Senate, the Assembly concurring, That a joint committee be appointed of three members of the Senate and five members of the Assembly, with power to send for persons and papers, to inquire and report:

First—What instruction has been given in agriculture and the mechanic arts in the University of California; whether the same has been defective or not; and if defective, wherein such defects consist, and what is the cause, as well as the remedy, of such defects.

Second—What has been the management, by the Regents of the University of California, of the one hundred and fifty thousand acres of agricultural lands donated by Congress to the State of California, and by the State to the University; whether the same has been defective or not; and if defective, wherein such defect has existed, and what is the cause, as well as the remedy, for such defects.

Third—Whether or not the Regents of the University have properly administered the funds of the University which have been intrusted to them; and if not, in what particulars.

Fourth—Also, upon any other matters relating to the University upon which, in the opinion of the committee, further information may be of use to the Legislature or the public.

The following persons were appointed as the joint committee:

Senate Committee—Laine, Keys, and Evans.

Assembly Committee—Amerman, Canfield, Freidenrich, Meyers, and Tinnin.

Office of the Board of Regents of the University,
San Francisco, March 3d, 1874.

To Hon. T. H. Laine, *Chairman of the joint committee of Senate and Assembly, to inquire into the management of the University:*

Dear Sir: In response to the invitation of your committee, the Regents of the University beg leave to present the following statement of facts, in the nature of a report. This report was carefully considered at a meeting of the Board held this day, and was unanimously adopted, and the Secretary was instructed to certify the same to you, as strictly correct in all parts and particulars.

I have the honor to be,
Very respectfully, yours,
J. WEST MARTIN,
Secretary pro tem. of the Board of Regents.

STATEMENTS OF THE REGENTS.

RESPONSE TO THE FIRST INQUIRY.

The first inquiry is as follows:

"*First*—What instruction has been given in agriculture and the me chanic arts in the University of California; whether the same has bee defective or not; and if defective, wherein such defects consist, an what is the cause as well as the remedy of such defects."

The following papers are presented as illustrating the work of th University in respect to education in agriculture and the mechanic arts especially the former. It is not for the Board to express an opinion a to whether this instruction is or is not "defective," but it may be prope to say that no complaint in respect to it has ever been addressed to th Board by any student, parent, teacher, professor, agriculturist, or othe citizen. It is safe to presume that the reports respecting its deficienc arise, in part at least, from a want of knowledge as to what has bee done, as to what difficulties have been encountered, and as to th experience elsewhere on this very subject.

I—THE REQUIREMENTS OF THE LAW.

(*a*.) SOURCES OF THE ENDOWMENT.

The University endowment is derived from six sources, namely:

1. The University or Seminary Fund, given by Congress to Califor nia, as to other new States, for the foundation of a University.
2. The Public Building Fund, derived, like the Seminary Fund, fro the sale of certain sections of land given by Congress to the State fo the construction of public buildings.
3. The property received from the College of California, on the con dition of maintaining a College of Letters. This acquisition include the site, of one hundred and sixty acres, more or less, at Berkeley.
4. The Congressional grant of eighteen hundred and sixty-tw commonly called the "Agricultural College Grant," given by Congre to California.

[As the purpose of this grant is often misunderstood, its exact term should be observed, as stated beyond.]

5. Special grants made by the Legislature, including the Tide Lan Funds, Special Building Fund, and annual appropriations.
6. Private gifts—among the most noteworthy, the gift of Tolan Hall, in San Francisco, and the land given by Mr. Edward Tompkin for a professorship.

(*b*.) THE LAW OF CONGRESS.

The fundamental law controlling one of the six sources of revenue by which the University is maintained, is the Congressional enactment of July second, eighteen hundred and sixty-two, by which a certain portion of the public domain was given to California, for the foundation of at least one college, the character of which is amply defined.

It will be observed, by the careful scrutiny of the enactment, that this law does not require the foundation of a mere College of Agriculture, but of a liberal and comprehensive institution, in which the modern sciences and their applications to human industry are especially to be promoted, without the disparagement of any other culture.

The exact words are these: the Congressional Fund shall be applied "to the endowment, support, and maintenance of at least one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

(*c*.) THE CALIFORNIA LAW, EXPRESSED IN THE "ORGANIC ACT."

The requirements of the State of California in organizing the University are thus stated in the "Organic Act:"

"The University shall have for its design, to provide instruction and complete education in all the departments of science, literature, art, industrial and professional pursuits, and general education; and also special courses of instruction for the professions of agriculture, the mechanic arts, mining, military science, civil engineering, law, medicine, and commerce; and shall consist of various colleges, namely:

"*First*—Colleges of Arts;

"*Second*—A College of Letters;

"*Third*—Such professional and other colleges as may be added thereto or connected therewith."

"The College of Agriculture shall be first established; but in selecting the professors and instructors for the said College of Agriculture, the Regents shall, so far as in their power, select persons possessing such acquirements in their several vocations as will enable them to discharge the duties of professors in the several Colleges of Mechanic Arts, of Mines, and of Civil Engineering, and such other Colleges as may be hereafter established. As soon as practicable, a system of moderate manual labor shall be established in connection with the Agricultural College, and upon its agricultural and ornamental grounds, having for its object, practical education in agriculture, landscape gardening, the health of the students, and to afford them an opportunity by their earnings of defraying a portion of the expenses of their education. These advantages shall be open in the first instance to students in the College of Agriculture, who shall be entitled to a preference in that behalf."

"The College of Mechanic Arts shall be next established; and in organizing this, or any other College, the same regard hereinbefore indicated shall be had for the general acquirements of each professor and instructor, so that he may be able to give general and special instruction in as many classes and courses of instruction as possible; an inasmuch as the original donation, out of which the plan of a Stat University has had its rise, was made to the State by virtue of th aforesaid Act of Congress, entitled an Act donating land to the sever States and Territories which may provide Colleges for the benefit o agriculture and the mechanic arts, approved July second, eighteen hundred and sixty-two, the said Board of Regents shall always bear i mind that the College of Agriculture and the College of Mechanic Art are an especial object of their care and superintendence, and that the shall be considered and treated as entitled primarily to the use of th funds donated for their establishment and maintenance by the said Ac of Congress."

(*d.*) THE PROVISIONS OF THE CODE.

The Code does not essentially change, in these particulars, the requirements of the organic Act; but, as some of the specifications are omitted for the sake of definiteness, the following provisions are quoted:

SECTION 1385. The University of California, located in Alamed County, has for its object general instruction and education in all th departments of science, literature, art, industrial and professional pursuits, and special instruction for the professions of agriculture, th mechanic arts, mining, military science, civil engineering, law, medicine and commerce.

SECTION 1386. There must be maintained in the University:

1. A College of Letters;
2. Colleges of Law and Medicine;
3. Colleges of Arts, as follows: of Agriculture, Mines, and Civi Engineering; and,
4. Such other Colleges as the Board of Regents may establish.

SECTION 1387. The College of Letters must embrace a liberal cours of instruction in language, literature, and philosophy.

SECTION 1388. Each full course of instruction consists of its appropriate studies, and must continue for four years.

SECTION 1404. A system of moderate manual labor must be established in connection with the Agricultural College, upon its agricultura and ornamental grounds, for practical education in agricultural an landscape gardening.

SECTION 1449. A practical agriculturist, competent to superintend th working of the agricultural farm, and to discharge the duties of Secretary of the Board of Regents, must be chosen by the Board as thei Secretary.

II.—HOW FAR ARE THE REQUIREMENTS OF THE LAW FULFILLED?

The requirements above quoted have been fulfilled by the Regent according to their best judgment, both in the letter and in the spirit and in accordance with the experience of the best institutions similarl established in other parts of the country.

By reference to the printed Registers of the University, it will be see that the College of Agriculture was first established among the so called "Colleges of Arts" which the law provided for. The College o

Letters was already in existence as the College of California, which gave up its property to the University.

The College of Agriculture, thus first established, has been steadily maintained from its commencement, with no diminution of its curriculum, but with increased advantages.

The introduction of manual labor was not possible until the removal to Berkeley, in the Autumn of eighteen hundred and seventy-three. Those students who desired it—more than fifty in number—were then employed in work upon the grounds.

Arrangements were also made for the removal of the Secretary's office and residence to the site of the University, as required by law; and the services of a competent business man, familiar with scientific and practical agriculture, were secured in the Secretary's office.

The actual condition of the courses now open to students in agriculture and the mechanic arts is indicated in the following paper, presented to the Board of Regents by the Academic Faculty. It was unanimously agreed upon as a correct statement, at a meeting when all but two of the voting members were present, and they afterwards expressed their entire concurrence.

REPORT FROM THE FACULTY ON THE COURSES NOW GIVEN IN THE DEPARTMENTS OF AGRICULTURE AND THE MECHANIC ARTS.

UNIVERSITY OF CALIFORNIA,
OAKLAND (Cal.), February 28th, 1874.

J. WEST MARTIN, ESQ., *Secretary Board of Regents:*

DEAR SIR: The inclosed document, which you will please to lay before the Regents of the State University, was prepared by a committee of the Faculty, in compliance with the request transmitted to the Faculty through President Gilman. After due consideration, this paper was unanimously adopted by the Faculty, as their statement of the matters brought under inquiry in the first of the resolutions given as instructions to the joint legislative committee of investigation.

It may be proper to state, that at the meeting at which this paper was adopted, all the voting members of the Faculty were present, except Professor Carr and Professor Swinton. They subsequently signified their entire concurrence. Most of the non-voting members were present, and all of these concurred.

I am, yours truly,

M. KELLOGG,
Dean of Faculty.

REPORT.

It may be premised, that the object of the course of instruction given in the University in all its departments, including those of agriculture and mechanic arts, is to furnish a broad and liberal culture adapted to the various callings of intelligent and educated citizens. With this aim in view, the course of instruction in the Colleges of Agriculture and Mechanic Arts has been so arranged as to embrace the following subjects:

1. *An English Course:* embracing the history and structure of the English language; ancient and modern history, rhetoric and logic. This course extends through four years.

2. A Course in *Modern Language:* embracing one or more modern languages, extending through three or four years.

3. A complete course of *Mathematics,* as constituting the basis of all scientific education, extending through three years.

4. A three years' course of *Mechanics and Physics.* Mechanics embracing the principles of machinery and the manifold applications of power; hydrostatics, hydraulics, and pneumatics; physics, embracing the principles of heat and its various effects in evaporation, rain and dew, etc.; the principles of the steam engine; electricity, magnetism, and electro-magnetism; acoustics, optics, and other physical subjects, the knowledge of which is necessary to the intelligent farmer and mechanic.

5. A three years' course in *Natural History and Geology.* The course in *Botany* embraces the structure and physiology of plants, *i. e.,* how plants germinate and grow and feed. The nature of their food, the circulation of sap, the changes which it undergoes, etc. The connection of this course with agriculture is close and direct.

The course in *Zoology* embraces comparative anatomy and physiology, and the laws of reproduction in animals. The connection of these subjects with stock-feeding and stock-breeding is evident.

The relation of geology to agriculture is scarcely less important, since soils are derived from the disintegration of rocks, and their nature and fertility are therefore largely determined by the character of the country rock.

6. A course of *Chemistry,* general and analytical, embracing qualitative and quantitative analysis and laboratory work. The importance of this course, as forming the basis of scientific agriculture and many branches of arts, is evident. This extends from two to four years.

7. A course of *Engineering and Surveying,* which is important in its applications to irrigation and reclamation of lands.

8. Courses in Astronomy, Physical Geography, and Political Economy.

9. Besides these eight courses, which provide such a liberal culture as every educated citizen should possess, and many portions of which have a close connection with practical agricultural and mechanical arts, a *special course* is given to the students in the *Agricultural College,* by the Professor of Agriculture, on the subjects relating more specifically to that department.

No special instruction is given in Applied Mechanics, except such as is given in the course of Mechanics and Physics, as no instructor has been provided for this department.

The special instruction in Agriculture and Mechanic Arts is still deficient in desirable completeness. To meet this deficiency, the following suggestions are made:

1. Facilities for scientific and practical experiments in *Agriculture* and *Horticulture,* including Botanic garden and an Arboretum.

2. Instruction in *Economic Botany and Zoology,* including the study of insects injurious to vegetation, as recommended in the reports of the Regents.

3. Special instruction in applied Mechanics, as already recommended in the report of the Regents, pp. 29 and 30.

SPECIAL INFORMATION IN RESPECT TO THE COLLEGE OF AGRICULTURE.

In order to throw as much light as possible on the subject of agricultural education in the University, the Secretary of the Board addressed the following letter to Dr. Carr, Professor of Agriculture:

LETTER TO THE PROFESSOR OF AGRICULTURE.

DEAR SIR: The Regents desire you to furnish, at your very earliest convenience, a statement of the instructions which you now give as a professor in the University, a statement of what you regard as feasible for the improvement of the instructions in agriculture and horticulture, together with any and all information at your command which may lead to a full discussion of the subject of agricultural education in California.

They especially desire to know whether the statements respecting agricultural education in our University, in the memorial of the Farmers' Granges to the Legislature, are correct: and if not, in what particulars they are incorrect.

Yours etc., J. WEST MARTIN,
Secretary pro tem.

RESPONSE FROM THE PROFESSOR OF AGRICULTURE.

GENTLEMEN OF THE BOARD OF REGENTS: Your letter, requesting me to furnish a statement of what my instruction now is, what I regard as feasible for its improvement, and whether the statements of the memorialists are true respecting agricultural education in the University, is received.

I am now giving instructions as follows: Two lectures a week on agricultural chemistry, to the junior class; two ditto to the senior class, on agriculture and horticulture; and one each week on hygiene, to the freshman class, as follows:

"The special studies in the Agricultural Course will include, in the Junior year, the chemical composition of agricultural plants; the plant, as an organism, adapted to perform a certain work; the material when wrought; the forces by which the work is accomplished; the relation of the plant to the atmosphere (agricultural meteorology) and to the soil; the nature, origin, and composition of the soil. The Senior studies will include tillage, irrigation, drainage, reclamation of land, field crops, sheep and cattle husbandry, forestry and arboriculture, sericulture, fruit and other special cultures, household and rural economies; together with a part of the lectures mentioned under the preceding year."

What I regard as feasible, and imperatively necessary, is, first: The adoption of a plan of operations for the practical development of the department. See communication to the Board, of September tenth, eighteen hundred and seventy-two; also, September third, eighteen hundred and seventy; May fifth, eighteen hundred and seventy; and plan of grounds submitted to President Gilman last year. See further report of your special committee, July sixteenth, eighteen hundred and seventy-two (the *apportionment* of land may require modification), recommending:

"That an annual appropriation of five hundred dollars be made for the purchase of seeds, etc., of our indigenous vegetation, for home use, exchanges, etc.

"That an annual appropriation of five hundred dollars be made fo the purchase and introduction of fruit trees not existing in this State.

"That a green-house and small propagating house be erected.

"That a competent gardener be appointed.

"That it shall be the duty of the Professor of Agriculture to supe intend these operations," etc.

To this I would add, that I consider it important not to lose anothe season of growth, and that the labor of students be utilized with a vie to confer skill in the pursuits of agriculture and horticulture.

Second—The employment of experts in special cultures, as the vine silk, fish, in veterinary science, agricultural entomology, and the me chanics of agriculture; to give from three to fifteen lectures annuall on each of the above specialties.

Third—The holding at the University of an annual Farmers' Insti tute, for discussions and comparisons of views and methods, as has bee done at other Agricultural Colleges (especially Illinois; see State re ports). It has been my aim, in carrying out the spirit of your resolu tion of eighteen hundred and seventy, to draw the attention of agricul turists to the University as their intellectual center.

Through what I believe has been considered a wise and liberal polic on the part of the Board, I have been able to study the agriculture o California with considerable detail, and to form an opinion of what ag ricultural education should be here. Our products are so varied, an our opportunities so great, that we shall in time require much more in struction than the University can furnish. I would advise that w limit ourselves at Berkeley to the practical illustration of the subject theoretically taught.

During the prolonged visit of Marshall P. Wilder, Downing, etc., t this coast, I had the benefit of his judgment and experience. H thought our grounds were well adapted to exhibit our horticultural po sibilities. He said: "There is no reason why your Agricultural Colleg should not draw students from every part of the country, and furnish complete series of object lessons for the most advanced scholars."

To the best of my knowledge and belief, we should have as many agr cultural students in proportion to our population as the statistics o other Agricultural Colleges show, if the means at your command ha enabled you to carry out the provisions of the organic Act.

All the above recommendations are made *on the supposition that th appropriations asked for by the memorialists are made*, and that "they d not expect this to be accomplished at once," but to be "reached wit proper economy and dispatch."

Respecting "Statements in regard to agricultural education in th memorial," etc.

The only questionable statement, as far as I know, is contained i this paragraph: "We find that of the monthly appropriation ($6,000) fo the regular expenses, only *one twentieth* is now devoted to the Agricul tural Department, and that one professor is now discharging all th duties of instruction on the subjects specially relating to it." Mr. Bax ter, one of the memorialists, explains that they simply state that ou special agricultural instruction employs one professor and one twen tieth of the funds; *not* that the agricultural students do not share th instruction common to all the colleges. This should have been mor explicitly stated. Thus understood, the statement is correct.

In conclusion, I would say, that whatever difference of opinion ma exist with regard to the scope of agricultural education, I am co

vinced that there has never been a time when the sentiments of the people of the State, expressed through effectual organizations or otherwise, were so favorable to the University in all its departments. Of this, the last clause of the memorial is sufficient proof.

Respectfully yours,

EZRA S. CARR,
Professor of Agriculture.

OAKLAND, February 26, 1874.

INSTRUCTION ON SUBJECTS RELATED TO MECHANIC ARTS.

The term "mechanic arts," as used in the Congressional Grant of eighteen hundred and sixty-two, has been generally considered to mean the various branches of human industry which are closely dependent on the progress of exact knowledge. Mechanism and machinery, the application of power to the production of material things, are founded upon the sciences of mathematics, physics, and theoretical mechanics. There is no good polytechnic school, or higher school of mechanics, in which these underlying subjects are not taught. They have received full attention in the University of California. The apparatus has been new and good; the courses of instruction have been comprehensive and extensive; the effort has been made to teach principles with thoroughness, and at the same time to show, as far as possible, the application of these principles to the various industries of society. It is true, that there are no shops connected with the University, nor is it certain that any can be successfully attached to the institution without incurring very large expense. But there are abundant opportunities in the neighborhood of the University—especially in San Francisco—to witness the great industrial undertakings, and to study the actual condition of mechanical enterprise.

The engineering studies of the University are closely related to the mechanic arts. These studies are not restricted to the measurement of land and the survey of the country, but they include the strength of materials, the principles of construction, the work of the architect and builder, the supply of water, and the control of water power, drainage, and sewage, the development of mines, and a score of other topics, in which the application of mathematics to strong and solid structures is involved.

The work of this department has been thus set forth. It will be noticed that in addition to the regular teachers, gentlemen who are expert in specialties are ready to coöperate with the University.

CIVIL ENGINEERING.

The course in civil engineering is so arranged as to meet the wants both of those who wish for a four years' course (including other scientific and literary studies, and leading to the degree of Bachelor of Philosophy), and also of those who wish merely to pursue special studies in engineering. Arrangements are likewise made for the advanced instruction of graduates of this and other institutions, who may, if they desire it, become candidates for the degree of Civil Engineer.

For the four years' course, the requirements are fully stated in the *University Register*, where the mathematical, scientific, and literary studies of the entire course are also enumerated. Students who pursu this course (which is recommended to all who can take the time), begi their engineering studies in the third or junior year.

Special studies of engineering must satisfy the professors that the are familiar with algebra, plane and solid geometry, plane and ana lytical trigonometry, spherical geometry and trigonometry, and ana lytical geometry and descriptive geometry, which are the mathematica studies pursued in the earlier part of the four years' course, and ar essential to higher studies.

The special engineering studies begin with the Surveying Course which can also be taken by those persons not desirous of other instru tion in engineering, provided they are familiar with the beforemen tioned mathematics, not including analytical geometry nor descripti geometry.

The course includes land surveying, with chain alone, with com pass, theodolite; hydrography, road and railroad surveying. Simul taneously, the study of differential and integral calculus is pursued.

The theoretical instruction of the class-room is continually supple mented by practical exercises, surveys, etc., in the field, and by excur sions for making itineraries, sketches, and general views of sections o the country, etc.

In the following year, the properties and strength of building mate rials are discussed and investigated. Stone-cutting, isometrical pro jections, and working drawings for constructions of masonry ar included; and this is followed by instruction in framing and bridg building, and in the mechanics of engineering.

The plotting of and working up of the field notes, surveys, etc., mad during the practical exercises of the year, will be completed in con nection with the other instruction of this department.

Advanced students take up the subjects of geodetic and hydrographi surveys, with construction of maps of extensive tracts of country, rive lake, and harbor improvements; drainage of cities and districts; analy sis and discussions of the most remarkable engineering construction original plans and estimates; and solution of practical problems.

In addition to the professors at Berkeley, Professor George Davidson Chief of the United States Coast Survey on the Pacific, will instruct th advanced students in the methods and instruments employed by th United States Coast Survey, in the determination of longitude by tele graph, and in certain astronomical problems.

Mr. Wm. H. Hammond Hall, Engineer of the Golden Gate Park, Sa Francisco, will illustrate, in the office and in the field, some of the prin ciples and methods in landscape engineering.

Mr. James D. Hague, Mining Engineer, will instruct the class in th methods of mining engineering, as shown in the mining works of th Comstock lode, as described by him for the United States Governme in the "Mining Industry of the Fortieth Parallel."

Professor Charles F. Hoffman, Topographical Engineer of the Sta Geological Survey, will explain to the class the topographical work o the California Survey.

Illustrative models, diagrams, etc., are employed to facilitate instruc tion, and the course will be made as practical as possible by the invest gation of hypothetical cases, the solution of original problems, and b excursions to prominent engineering structures within reach—such a the Navy Yard, public buildings, the dry dock, and forts in the harbo of San Francisco.

As an illustration of the exact worth of this branch of the University, the examination paper is appended for a single term, on the subject aforesaid. Other subjects are treated with like fullness.

1. According to Mr. Scott Russell's formula, what will be the resistance to motion of a train of cars weighing one hundred and fifty tons, with a frontage of seventy-five feet, moving at twenty miles per hour over a straight and level road? What will be the *total* resistance of a twenty-ton locomotive when drawing the above train?

2. A locomotive weighing eighteen tons, with a tender of twelve tons, can move a train of four hundred tons at twelve miles per hour on a straight and level road. What load can it draw up an ascent of fourteen feet to the mile, at the same rate of speed?

3. Make a drawing of the plane, elevation, and cross section of a railway having continuous bearings, combined with cross-ties. Compare this system with that, employing supports at intervals.

4. What is the principle upon which atmospheric railways depend for their power? What is the chief obstacle to be overcome in their construction? What are their advantages and disadvantages?

5. When are tunnels necessary in railroad construction? Deduce a formula giving the depth at which a cutting should change to a tunnel.

6. What are the causes of the increased resistance to motion on railroad curves? To what is this increase assumed to be proportional? If the total curvature in the Central Pacific Railroad amounts to twenty-seven thousand four hundred and eighty degrees, to what additional length of road is it equivalent?

7. Discuss the tractive power of a locomotive, as limited by adhesion. How may it be increased? What would be the limit, from this cause, of the tractive power of a locomotive weighing twenty tons, two thirds on the driving wheels, four in number, if a train was to ascend an incline of one in seven=8° ¼, nat. sin.=.14349? What would be the loss of power with a horse? Why?

8. What is the scale of declivity of a line? What is its use, and how is it constructed? State the same with regard to a plane.

9. Describe the *geometrical* formation, by cylinders, of the soffits of the groined and the cloistered arches. How are the centers, or supports of their masonry, constructed, knowing the diameters of the soffits?

10. What are the advantages possessed by straight over curved lines of railways? What is the maximum expenditure justifiable in straightening a railway? What are the recommendations of curves? How do the traffic and character of the engines on a road determine the depths of its cuttings and embankments?

FURTHER PLANS FOR INSTRUCTION IN MECHANIC ARTS.

To popularize the work of the University, the Regents instituted, at the beginning of their work, six courses of lectures in San Francisco, adapted, as far as possible, to the needs of intelligent mechanics, teachers, and others, who are there desirous of adding to their knowledge of modern science. Five of these courses have been given, and have been well attended by those for whom they were designed.

It was not supposed that these courses would do more than serve a temporary purpose, but it was hoped that they would lead to the foundation in San Francisco of a Polytechnic School, or School of the Useful Arts. During the present Winter a member of the Board of Regents, who has taken the liveliest interest in this branch of education, and who appreciated the incompleteness of what is now doing, secured from number of gentlemen the guarantee for two years of a sum of mone sufficient to begin a school of this sort, on a comprehensive foundatio independent of, and yet affiliated with the University.

As the result of much thought and consultation, the following schem was proposed and approved by the parties interested in the project:

1. Let the donors give their money to three or five Trustees, wh shall dispense and account for all sums paid out, and manage the whol enterprise.

2. Let a Council of seven men advise these Trustees as to the be mode of executing the details of the plan.

3. Let a man of scientific education, who is also acquainted with th industrial applications of science, and who is in hearty sympathy wit the desires of the common people, be made the Director of the school.

4. Let him, with the approval of the Trustees, select assistant teachers, from five to ten in number, to give instruction in the variou branches of industrial science and art.

5. Let the Trustees provide also for popular lectures, illustrated a far as possible, before small and large audiences, on the most recent an useful discoveries adapted to the wants of common life.

6. Let the instruction be given in evenings, at early morning hour or holidays, in vacations; and let it be given in short courses, runnin through a certain number of weeks or months, so as to supplement, a far as possible, the public schools and all other existing institutions.

7. Let rooms be hired in central and convenient places, adapted fo lectures, class-rooms, and workshops; and let them be equipped with moderate amount of implements, tools, and apparatus.

8. Let special provision be made for instruction:

(*a*) In chemistry, as it relates to metal working, assaying, electro plating, bleaching, dyeing, and other branches of manufacture.

(*b*) In mechanics, in relation to the principles of the steam engine the turbine, the hydraulic press, the loom, the lathe, and other mechanisms.

(*c*) In industrial drawing, especially as it relates to the construction o buildings, machines, engines, etc.

(*d*) In the study of the earth and its resources; especially in th study of California, its climate, mineral wealth, vegetation, commerce etc.

(*e*) In domestic and political economy, the conditions of social an individual happiness.

9. Let the Trustees and Council especially seek the coöperation o the University of California, and the Mechanics' Institute, of San Francisco, so as to utilize, as far as possible, the professors, the apparatus the museums, and the libraries already provided.

CHEMISTRY.

Chemistry, like natural philosophy, is indispensable in any course o instruction which relates to the mechanic arts. Metallurgy, assaying agriculture, and almost all departments of manufacturing industry, ar more or less dependent upon the progress of chemical knowledge. This subject has, therefore, received from the Board full consideration, an the laboratories provided at Berkeley are, in all respects, admirably adapted for instruction in this fundamental science.

Instruction is given in general and theoretical chemistry by lectures recitations, and laboratory practice. This course extends through three terms; one in freshman year, and two in sophomore year; and embraces the elements of inorganic and organic chemistry. Students, after making themselves familiar with the details of experiments, are required to repeat the same in the laboratory for elementary chemistry.

An advanced course of lectures will be given to students of the junior and senior classes in general and theoretical chemistry. This course will embrace a discussion of the general principles of the science, and their application to analytical and metallurgical chemistry, and to mineralogy.

The chemical laboratories will be opened daily for instruction in analytical chemistry.

The course of instruction in qualitative analysis will include the analysis of simple and complex substances in the wet way, their analysis by the use of the blow-pipe and flame reactions, and the determination of minerals with the blow-pipe. Students will be required to keep a careful record of their work, and to submit the same to the inspection of the professor. Upon passing a satisfactory examination in qualitative analysis, students may pass to the quantitative laboratory.

In the quantitative laboratory, instruction will be given in the quantitative gravimetric analysis of simple and complex salts, minerals, ashes of plants, mineral waters, etc., in volumetric analysis, including acidimetry, alkolimetry, chlorimetry, etc., in organic analysis; in gas analysis; in the preparation from inorganic and organic compounds, and in the carrying out of original investigations.

Students taking the course of chemistry will be expected to spend at least fifteen hours a week in the laboratory during junior year, and twenty hours a week during senior year.

Students who, for satisfactory reasons, do not wish to take the full course, may enroll themselves with the Professor of Chemistry as special students. Students wishing to take a post-graduate course will find an abundant opportunity for pursuing their studies.

Every opportunity possible is made use of to give instruction in those branches of chemistry which have a practical application to the arts.

A room for the study of photography, in connection with the chemical laboratory, will be opened as soon as the necessary apparatus can be supplied.

Practical instruction in electro-metallurgy will be given to such students as desire it.

So far as practical, students will be employed in the preparation of chemicals used in the laboratories; the object being to give them as much practice in manufacturing chemistry as is possible.

Special training in the analysis of mineral waters will be given to such of the advanced students in chemistry as may desire it.

Careful lists of waste products, minerals, etc., which may be utilized, will be kept, and students instructed in methods of saving them.

RESPONSE TO THE SECOND INQUIRY.

MANAGEMENT OF THE AGRICULTURAL COLLEGE LAND

Second.—"What has been the management by the Regents of the on hundred and fifty thousand acres of agricultural lands donated by Congress to the State of California; whether the same has been defectiv or not; and if defective, wherein such defect has existed, and what i the cause as well as the remedy of such defect?"

By the organic Act creating the University, the Board of Regent were invested with full powers to locate and sell the Agricultural College lands "for such price, and on such terms only as they shall prescribe."

The first step taken by the Board for the sale of these lands wa the passage of the following resolution, on the twenty-seventh o August, eighteen hundred and sixty-eight:

Resolved, That warrants be prepared in such manner and form as th Law Committee may decide to be legal and proper, authorizing th holder to locate one hundred and sixty (160) acres of land, as a portio of the one hundred and fifty thousand acres granted to this State by the Act of Congress of July second, eighteen hundred and sixty-two that these warrants be numbered from number one to number sixty, inclusive; that a minimum price be fixed by the Board of Regents, and that the Secretary be then authorized to invite proposals for the purchase of these warrants by advertisement for thirty or sixty days."

At the same meeting the minimum price of these lands was fixed a five dollars per acre, in gold coin. After full advertisement no bid were received for the purchase of these land warrants.

On the tenth of November the Board authorized the Secretary to sell at private sale, the nine thousand six hundred acres previously advertised, at a price not less than five dollars per acre, in gold coin.

Under this authority but four warrants, calling in the aggregate fo six hundred and forty acres, were sold.

It soon became apparent that the lands could not be sold through th medium of land warrants at five dollars per acre, all cash.

On the second of March, eighteen hundred and sixty-nine, the Boar received a proposition from a responsible party to purchase the entir grant of one hundred and fifty thousand acres at three dollars and a half per acre, in gold.

This proposition was declined.

Finding all efforts to dispose of the lands by sale of warrants and by private contract unavailing, and the area of desirable public lands, subject to location, rapidly diminishing, the Board entered into a contract with three experienced surveyors and land experts (Messrs. John C. Hays, G. Howard Thompson, and H. A. Higley), authorizing them, as locating agents of the University, to locate the one hundred and fifty thousand acres of land; they to receive, for their compensation, a percentage upon the price per acre for which the lands might be afterwards sold, and they to pay all the expenses of location.

This step, it will be observed, contemplated the obtaining of title to certain fixed tracts of land, and holding the same for a market.

Under this contract several thousand acres of land were located in the Tulare Valley; but as they were subsequently, for good reasons, abandoned, no progress was made thereby in the disposition of the grant.

On the eighth of October, eighteen hundred and sixty-nine, the Board appointed H. A. Higley, Land Agent of the University, with authority to sell the college lands at five dollars per acre, in gold coin; of which twenty per cent should be paid in cash, and a credit allowed for the remaining eighty per cent, with interest on the unpaid balance, payable in advance, at the rate of ten (10) per cent per annum.

Even on these favorable terms but slow progress was made in the disposition of the lands. The sales languished, and finally almost ceased, while the available public lands were becoming rapidly absorbed by preëmption, by railroad grants, and by location of the cheap college scrip of other States, and of other land scrip of various kinds.

Unless further legislation could be obtained, it was apparent the grant could not be sold at five dollars per acre, in coin.

The Regents set themselves to work with zeal to procure such further legislation from Congress. With that view they drew up the *projet* of a bill, which they transmitted in December, eighteen hundred and sixty-nine, to our Senators and Representatives in Congress, and asked their influence to procure the passage of the same.

This bill contained special privileges to be conferred upon the State of California—in the manner of locating its grant—and on this account, strong opposition was made to its passage.

It was not until March third, eighteen hundred and seventy-one, that the bill was finally passed by Congress, and this, only, through the extraordinary efforts made by the Regents, backed by the united influence of our delegation in Congress.

This bill provided, among other things:

First—That the State should have the right to make its selections "from any lands within its limits, subject to preëmption, settlement, entry, sale, or location, under *any* laws of the United States," thus removing many restrictions, and greatly enlarging the area for location.

Second—Permitting the State to make a selection for the smallest legal subdivision, to wit: for forty acres. This was a valuable privilege, as prior to the passage of this Act the smallest tract that could be located was one hundred and sixty acres, and the regulations of the General Land Office required that even this amount should be a technical quarter section. It would not permit the location of two eighty-acre tracts, though adjoining, if in separate quarter sections.

Under the operation of this provision, three hundred and forty-one separate applications have been made for tracts of forty and eighty acres each.

Third—Under the law, as it formerly existed, in case lands were selected within the limits of a railroad reservation, commonly known as double minimum lands, the State was compelled to surrender two acres of its grant for every acre located, and the purchaser was, ther fore, compelled to pay ten dollars per acre. This practically put a sto to the sale of double minimum lands.

The new law, in such a case, permits the State to select lands withi a railroad reservation, acre for acre, paying to the United States th sum of one dollar and twenty-five cents per acre for each acre s selected. The effect was to reduce the price of such lands from te dollars an acre to six dollars and twenty-five cents per acre.

But the most important provision of the Act was the following:

> "That where lands sought to be selected for the Agricultural Colleg are *unsurveyed*, the proper authorities of the State shall file a statemen to that effect, with the Register of the United States Land Office, d scribing the land by township and range, and shall make application t the United States Surveyor General for a survey of the same. * * He shall, as soon as possible, have the said lands surveyed, and th township plats returned to the United States Land Office, and lands s surveyed and returned shall, for thirty days after the filing of the plat in the United States Land Office, be held *exclusively* for location for th Agricultural College; and within said thirty days the proper authori ties of the State shall make application to the United States Land Offic for the lands sought to be located, by sections and parts of sections *provided*, that any rights, under the preëmption or homestead laws acquired prior to the filing of the required statement with the Unite States Register, shall not be impaired or affected by this Act."

Under the operation of this Act, a demand for the college lands rap idly sprang up, and through its instrumentality the entire grant ha been disposed of on the terms fixed by the Regents.

TERMS OF SALE.

The rate charged is, for single minimum lands, five dollars per acre and for double minimum lands, six dollars and twenty-five cents pe acre, in gold coin.

On the latter, however, the Regents are required to pay to the Unite States Receiver one dollar and twenty-five cents per acre, in addition t the surrender of an acre of their grant. The Regents receive this one dollar and twenty-five cents per acre from purchasers, in gold, and pay it in currency to the Receiver; thus realizing a profit of about twelve and a half cents per acre, over and above the fixed price of five dollars to assist in defraying the expenses of administration.

The Act of Congress making this grant requires that the State shall pay all such expenses.

CREDIT ALLOWED.

If purchasers prefer, they are permitted to pay twenty per cent (2 per cent) or one dollar per acre in cash, and are allowed a credit for the remaining eighty per cent (80 per cent), of four dollars per acre, the unpaid balance bearing interest at the rate of ten per cent (10 per cent) per annum, payable in advance.

Each applicant is required to sign an agreement that he will pay in full, after the expiration of five years from the date of his application and after one year's notice, when demanded by the Land Agent; and if

all the conditions of the agreement are not complied with, then the lands to revert to the University without suit, and any approval of the application to become null and void. In the case of double minimum lands, surveyed, it was, at first, the practice to exact of the purchaser but one dollar and a quarter per acre, or twenty per cent of six dollars and a quarter (the price per acre), the hope being indulged that the Federal Government might be induced to remit to the University the payment of the excess of one dollar and a quarter per acre, required to be paid on this class of lands.

This hope was dissipated some six months ago by the instructions of the Commissioner of the General Land Office, notifying the United States Land Offices for California, that title would not be made to the State for double minimum lands unless this excess of one dollar and a quarter per acre was prepaid.

Since that time the Regents have required from purchasers a cash payment of two dollars and a quarter per acre on such lands—being one dollar or twenty per cent of five dollars, for the University, and one dollar and a quarter, the excess to be paid to the Federal Government.

Parties are allowed to pay up, in full, either at the time the Regents are prepared to make title to them, or at any subsequent time.

It should be borne in mind, that in all cases the title to these lands is obtained in the name of the Regents of the University, and remains in their name until full payment is made. Then, and not until then, title is issued by patent to the purchaser.

When parties avail themselves of the credit allowed, a certificate of purchase is issued to them after they have paid up twenty per cent of the price—interest in advance from the date of approval of their location by the Land Agent, to the succeeding first of January, and eight dollars fees. These fees are paid into the Treasury of the University at the time the certificate of purchase is issued, and with other items of revenue, which will be explained by and by, realize a sum more than sufficient to defray all the expenses of administration.

For some time, purchasers were not required to pay the twenty per cent, or first installment, until the Land Agent had obtained title, in the name of the Regents, for the lands sought, and notified the applicant of that fact. But experience soon showed that this practice was unwise. It left it to the option of the applicant to take the lands or not, as convenience or interest might dictate, without apprehension of loss from failure to fulfill his contract. The rule was, therefore, speedily established, that the applicant should give security to the extent of one dollar per acre, at least, that he would take and pay for the lands, if the Regents should succeed in procuring title to same.

He is now required, as a condition precedent, to furnish the Land Agent with a certificate of deposit, which, on its face, shall state that he has deposited an amount equivalent to one dollar ($1) per acre, to the credit of the Regents of the University, payable when indorsed by said Regents. This, bear in mind, is not a payment, it is only security; and is held by the Land Agent until the Register of the Land Office accepts or rejects the application.

If the application is accepted, the certificate of deposit is indorsed by the Regents, and then, for the first time, it becomes a payment. It is paid to the Treasurer of the University, and becomes a part of the Land Fund.

If, on the other hand, the application is rejected by the United States

Register, the certificate is indorsed by the Regents back to the order the depositor or applicant, and this is the end of the transaction.

Sometimes an application is accepted for part of the lands applied fo and rejected for another part. In this case, the original certificate subdivided into two new certificates, one of which is indorsed to th order of the applicant, and the other paid into the Treasury of the Un versity.

This statement covers the whole financial system.

PRECAUTIONS TAKEN TO PROTECT SETTLERS.

In the management of this grant, it has been the anxious desire of th Regents throughout, to avoid all contests with bona fide occupants o land, even though said occupants, through neglect or ignorance, ma have taken no steps to perfect their equitable rights

It is, of course, impracticable for the Land Agent to examine each o the numerous parcels of land applied for. He cannot know, of his ow knowledge, therefore, whether parties other than the applicants hav made improvements thereon or not; but, under the instructions of th Regents, he takes all reasonable precautions to ascertain the fact.

Before an application is received, the applicant is required to subscrib and swear to the following affidavit, before some officer competent t administer an oath:

"I, —— ——, of —— County, State of California, being duly sworn depose and say that I am a citizen of the United States, and a residen of the State of California, of lawful age; that to the best of my knowl edge and belief, there are no legal or equitable claims of any kind t the above described land, nor any occupation of, nor any improvement upon the same, under any legal or equitable title other than those o the applicant; and that the above described lands are not timbere lands, and that each legal subdivision in the above described tracts i more valuable as agricultural than as mineral land.

"Subscribed and sworn to before me, this —— day of ——, 187–.

—— ——.

"Witness my hand, —— ——."

[If the lands should happen to be timbered, the clause "and that th above described lands are not timbered lands," is stricken from the affi davit. In such cases, special arrangements are made, which will b explained presently.]

With this affidavit in hand, the Land Agent then applies to the Register of the United States Land Office for the district in which th land is situated, to locate, in the name of the Regents of the University, as part of the Agricultural College grant to California, the parce of land, described by section, township, and range, which the applican desires to purchase.

Even though upon the books of the Register the land appears fre and open to location, he retains the application of the Regents for ninety days after its receipt, in his office, without action. This, to give an party having equitable claims to said land an opportunity to make hi entry, and prove up his claim. If, at the expiration of ninety days, n counter claimant appears, the Register accepts the application on behal of the University, notifies the Department in Washington of such acceptance, and also the Land Agent of the University.

The latter, even then, does not issue title to the applicant, but as a measure of extra precaution, to give equitable claimants, if any, every possible opportunity to secure their rights, retains the Register's acceptance still thirty days more, in his hands.

If, at the expiration of that time, no other claimant appears, a certificate of purchase is issued to the applicant.

From this statement, it will appear that the shortest time in which an applicant can procure title is four months from the date of his application—in practice, it is oftener six months. We respectfully submit, that having due regard to the efficient management of this grant, it is impossible for the Regents to adopt any more effective precautions to protect the rights of unknown counter claimants. It has been their policy and their practice, as long as the matter remains subject to their control, which is up to the time of the approval of a location by their Land Agent (after which a contract exists which they cannot invalidate), to abandon, whenever they can do so, in justice to the applicant, any and every location, where a claimant appears with even a faint show of equitable right.

TIMBERED LANDS.

In case the lands applied for are timbered, the purchaser must either pay in full; or, if he claims a credit for eighty per cent, he must, before title is issued to him, furnish a bond, with approved sureties, to secure the payment of the unpaid balance.

UNSURVEYED LANDS.

The University has, since the passage of the Act of March third, eighteen hundred and seventy-one, had the right to locate upon unsurveyed lands.

At the inception of their administration, no deposit was exacted from applicants for this class of lands, but they were informed that applicants for surveyed lands would always be preferred, even though later comers, and that we should not hold ourselves bound to furnish them title if the grant should be exhausted at the time their survey might be completed.

Availing themselves of their privilege, parties, two or three years ago, applied for more than two hundred thousand acres of unsurveyed lands—some of them for very large tracts. These applications are now of no practical interest; as the parties have never taken steps to have the lands surveyed, and as the grant is now exhausted, they could not obtain title if they were to show that the surveys have since been made.

Under the Act of Congress, approved March third, eighteen hundred and seventy-one, the Regents obtained the right to secure title to unsurveyed lands, by applying to the United States Surveyor General for an order of survey, and notifying the Register of their intention to locate such lands, describing them by township and range.

Under the law, this gives them the exclusive privilege of locating the lands applied for, for a period of thirty days after the plats of survey are filed in the Register's office.

All parties applying for unsurveyed lands, under the provisions of this Act, have been for some time past required to furnish the same certificate of deposit to the credit of the Regents of the University as in the case of applicants for surveyed lands.

In all such instances, it is believed the applicants are acting in go faith, and will take and pay for their lands when the surveys are co pleted.

AMOUNT REALIZED.

The total amount of cash received to date, as principal from the sa of college lands, is one hundred and fourteen thousand and twenty-fi dollars and forty-seven cents. Of this amount, seventy-nine thousa seven hundred and nine dollars and ninety-six cents is deposited by t Treasurer of the University in the Bank of California, bearing intere at the rate of six per cent (6 per cent) per annum. The remaind thirty-four thousand three hundred and fifteen dollars and fifty-one cen was temporarily invested in the purchase of four full blocks, with e tensive improvements, in the heart of the growing City of Oaklan being the property formerly owned by the College of California and t Brayton estate. This property is subject to a mortgage of fifty tho sand dollars, bearing interest at the rate of nine per cent per annum.

It has cost, to date, including eleven thousand three hundred a eighty-six dollars and twenty-five cents paid as interest on the mortgag the sum of one hundred and twelve thousand four hundred and sevent six dollars and twenty-five cents, and is valued by the most compete experts at a minimum of one hundred and fifty thousand dollars. many it is rated even higher.

Since the removal of the University to Berkeley, this property is longer essential. It is growing in value, however, year by year. Shou it be deemed best to dispose of it, it will realize a sum—say one hundr and fifty thousand dollars at least—sufficient to pay off the mortgage fifty thousand dollars, to repay the Land Fund the thirty-four thousa three hundred and fifteen dollars and fifty-one cents borrowed, and lea a surplus of sixty-five thousand six hundred and eighty-four dollars a forty-nine cents, yielding in the shape of profit a far larger interest up the amount of the Land Fund invested, than could possibly have be derived from any ordinary safe investment.

Only the interest upon the principal of the Land Fund can be used f the payment of current expenses. The total interest collected to dat on this acconnt, is thirty-two thousand two hundred and twenty-o dollars and fifty-seven cents.

EXHIBIT.

The following is a detailed exhibit, showing the number of acres agricultural lands sold, and the amount received therefor:

9,694 acres land sold at $5 per acre	$48,470 00	
346 74-100 acres sold at $6 25 per acre	2,167 15	
21,436 66-100 acres sold at $5 per acre, upon which 20 per cent was paid, and balance on time, bearing 10 per cent interest per annum	21,436 66	
15,034 86-100 acres sold at $6 25 per acre, upon which 20 per cent was paid, balance on time, bearing interest at 10 per cent per annum	18,703 41	
4,031 65-100 acres sold at $5, upon which 20 per cent was paid, and balance afterwards paid in full	4,031 65	
Balance 80 per cent, subsequently paid on same	16,126 60	
480 acres sold at $6 25 per acre, upon which 20 per cent was paid, and balance afterwards paid in full	600 00	
Balance 80 per cent on same	2,400 00	
		$114,025

Amount brought forward			$114,025 47
From interest on amounts due from sales of land		$32,221 59	
From land fees		2,544 00	
From excess payments		4,760 87	
			39,526 46
			$153,551 93
Total number of acres sold	51,023 91-100		
Total payments $114,025 47			
Add for interest and land fees 34,765 59			
	$148,791 06		
Balance of 80 per cent due on sales @ $5	75,889 12		
Balance of 80 per cent due on sales @ $6 25	74,774 46		
	$299,454 64		

In addition to these lands sold, and for which title has been issued, applications are on file, and pending the decision of the United States Land Registers, for eighty-one thousand and ninety-three acres of surveyed lands, and thirteen thousand four hundred and eighty acres of unsurveyed lands.

The parties applying for these lands have deposited one dollar an acre in bank, to the credit of the Regents of the University, and certificates of deposit to the amount of ninety-four thousand five hundred and seventy-three dollars are now in the hands of the Land Agent.

RECAPITULATION—CONDITION OF THE GRANT.

Number of acres sold, for which title has been issued	51,023.91
Applications for surveyed lands pending in hands of U. S. Registers, on which deposit has been paid	81,093.00
Unsurveyed lands applied for, and awaiting survey, on which deposit has been paid	13,480.00
	145,596.91
Number of acres selected by Locating Agents, and forfeited by applicants—now the property of the University	,840.75
Total	154,437.66
Applications filed (without deposit) for unsurveyed lands, say for	210,000.00

It will thus be seen that we have apparently oversold our grant to the extent of four thousand four hundred and thirty-seven and sixty-six one hundredths acres; but more than this amount will doubtless be rejected by the United States Registers, in cases of contest now pending before them.

Under these circumstances, we have declined to receive any more applications.

Until the Registers report upon our applications now in their hands, we cannot know exactly for how many acres located, we can obtain title.

In conclusion, we think we can justly claim the credit of having sold these lands to the best possible advantage. Our management certainly compares favorably with that of other State Boards and officers having control of the several land grants made by Congress to the State of

California. Of the five hundred thousand acres donated for intern improvements, and afterwards devoted to the support of public schoo but a portion was sold in the shape of land warrants, for two dolla per acre; the remainder for one dollar and twenty-five cents per acr or an average, say, of one dollar and sixty-two and a half cents p acre.

The sixteenth and thirty-sixth school sections, and the so-called li lands, also the Seminary and Public Building lands, were sold by th State at one dollar and twenty-five cents per acre, and the swamp lan for one dollar, while we, entering the field, substantially, not until th year eighteen hundred and seventy-one, by which time desirable publi lands, subject to location, had been closely gleaned, have so managed a to sell, or contract to sell, our entire grant of one hundred and fift thousand acres, at five dollars per acre in gold coin, net.

There is not, so far as we are informed, another State in the Unio that has sold her Agricultural College Grant for one fifth as much a we have obtained. Some States sold their College lands as low as fort cents, others for fifty cents, and a few of them as high as seventy-fi cents per acre in currency. The average price for all of them does no probably exceed sixty-two and a half cents, currency, per acre.

So much in answer to the inquiry relative to the Agricultural Lan Grant.

RESPONSE TO THE THIRD INQUIRY.

HOW THE REGENTS HAVE ADMINISTERED THEIR TRUST.

"*Third*—Whether or not the Regents of the University have properly administered the funds of the University which have been entrusted to them; and if not, in what particulars."

The organic Act creating and organizing the University of California was approved March twenty-third, eighteen hundred and sixty-eight. The Regents organized on the ninth of June, eighteen hundred and sixty-eight. Since then, nearly six years have elapsed, and they propose to render an account of their stewardship. At the outset, the prospect was not encouraging. All they possessed to represent a University, was an uninhabited site at Berkeley. Everything had to be created.

It was necessary, at the very start, to secure a corps of professors of ability and reputation, for it was clear that men of moderate attainments—cheap men, picked up hap-hazard—could never build up an institution of grade so high as to bring back the youth of California from Harvard, and Princeton, and Yale, and other Eastern colleges of note, to which they had been in the habit of resorting in search of the higher culture; or, failing to recall those already gone, at least to retain those looking for a University education.

The Regents devoted much time and anxious consideration to the selection of a proper Faculty; and after the lapse of six years, they have cause for congratulation that they succeeded so well. The professors, as a body, are men of the highest attainments; some of them with a national reputation. They are devoted to their profession—zealous in the discharge of their duties, and anxious to establish such a name for our University, that no young Californian need go farther in search of the highest learning. We venture to assert that but few institutions—and those few only from their splendid endowments—surpass us in the range and variety of the curriculum, and in the high character of the instruction imparted.

An examination of our latest "Register" will show that almost every branch of useful learning is taught in our University, so far as the same can be compressed into so brief a period as a four years' course.

Next to the securing of an able Faculty, the most important step was to obtain suitable accommodations. Thanks to the generosity of the old College of California, we secured the use of their grounds and buildings in Oakland, where the law permitted us to locate the University temporarily, until it could be established on its permanent site at Berkeley. The Regents obtained the free use of these buildings on condition that they would organize the College of Letters with a full course, so that such of the students of the college as might desire, and should b found qualified, might proceed with their studies in the University.

The University was first opened on the twenty-third of Septembe eighteen hundred and sixty-nine, with an attendance of forty-two students, most of whom had belonged to the four classes of the college.

At a later date, negotiations were opened with the Trustees of th College of California, which resulted in the transfer to the Regents o all their property and assets, on condition that they (the Regents) shoul pay their liabilities. This property consisted of an entire block, wit commodious buildings, in the heart of Oakland; a large number of valu able homestead lots at Berkeley; one hundred and twelve acres of so called "mountain land," in the same neighborhood; all the Colleg water company's rights; the whole estimated to be worth eighty thousand dollars.

The liabilities of the college, assumed and paid by the Regents, ove and above the cash since received from the sale of a portion of the assets amounted to forty-nine thousand and thirty dollars and four cents.

On the eleventh of November, eighteen hundred and seventy, th Board authorized the purchase of the so-called Brayton property, in Oakland, consisting of two full blocks, with the valuable and extensive buildings thereon, together with the furniture therein. On this property mortgage of fifty thousand dollars existed. In payment, the Regent assumed the mortgage (on which the interest was subsequently reduce to nine [9] per cent) and transferred to the vendors the outside property, valued at about thirty thousand dollars, adjoining the Universit site at Berkeley, which had been obtained from the College of California.

The property was thus obtained without any additional cash expenditure.

Later, a third block was bought of the Brayton estate for the su of twenty thousand dollars, thus completing, with the block obtaine from the College of California, the quadrangle of four blocks, situate between Twelfth and Fourteenth, Franklin and Harrison streets, in th City of Oakland.

This entire property was occupied by the University up to the sixteenth of July, eighteen hundred and seventy-three.

The purchase has proved profitable to the State. It saved the heav rent that we should have been obliged to pay for so extensive a property, and, practically, gave us ample accommodations, rent free, for period of four years.

Nor is this all. The property has enhanced materially in value, an and is now worth many thousands of dollars more than it cost, includin the interest paid on the mortgage.

The Board of Regents took steps, at an early day, to erect the necessary buildings for the University, on the permanent site at Berkele In view of the searching and exhaustive investigation recently made b committees of the two Houses of the Legislature, we shall not attem to set forth the action of the Board in detail.

The Regents first attempted to build the College of Agriculture ou of the funds derived from the sale of the tide lands paid to them by th State, by days' labor; but finding, after the expenditure of fifty-fou thousand five hundred dollars and seventy-two cents on the granite basement, that the structure would cost too much, and that their mea would not permit them to complete it, they suspended work.

By the Act approved April first, eighteen hundred and seventy-tw the Legislature appropriated three hundred thousand dollars for the construction of University buildings at Berkeley. A contract was subsequently made for the completion of the Agricultural College building, for the sum of one hundred and twenty-six thousand dollars, an amount considered quite reasonable by experts best competent to judge. The building has cost, altogether, about two hundred thousand dollars. It is, we believe, one of the best, if not the very best, constructed public buildings in the State. It is finished in excellent style, and may be expected to endure for generations.

Originally, it was designed to put up a second building, to be called the College of Letters, of the same substantial and permanent character, built of stone, brick, and iron. Two considerations induced a change of plan:

First—The brief time within which it would have to be constructed to be in readiness for occupation on the twentieth of September, eighteen hundred and seventy-three; and.

Second—The insufficiency of means.

The Regents were determined that one public building, at least, should be completed without exceeding the appropriation.

This necessitated a change of plan from stone, brick, and iron, to wood, with a brick basement. On the thirteenth of May, eighteen hundred and seventy-three, a contract was entered into for the construction of the College of Letters for the sum of eighty-three thousand seven hundred and fifty dollars; and on the sixth of September—just ninety-nine working days from the date of commencement—the building was completed, accepted, and occupied.

Adding the expense of several important additions, not called for by the specifications, and deducting the saving effected by alterations and omissions, the amount paid the contractors reached eighty seven thousand four hundred and sixty-eight dollars. The finish of the basement was not called for by the contract. For this, a further expenditure of about nine thousand dollars was made; making the entire cost of the building, exclusive of the equipment, about ninety-six thousand four hundred and sixty-eight dollars in Controller's warrants—equivalent, at the date of the issue of said warrants, to about ninety-two thousand four hundred and sixty-eight dollars gold.

A Commission, consisting of four able and experienced architects and builders, appointed by this Board to examine and report upon this building, have made a detailed estimate of its value, in gold coin, as it now stands.

This they fix at ninety thousand six hundred dollars, which is but one thousand eight hundred and sixty-eight dollars less than the cash value of the Controller's warrants paid for the completed building. Even a larger difference than this might be ascribed to the increased expense growing out of the rapidity of construction, called for by the contract. It is estimated that it would cost at least ten (10) per cent more, to erect so extensive a building in ninety-nine days, than in one hundred and fifty or two hundred days. But even if no allowance is made for this, the difference is not an unreasonable concession to the contractors, for their skill, labor, outlay of capital, and risk.

The Commission of architects and builders further report that the College of Letters is well built, and is admirably adapted for the purposes designed. Our own personal examination, and the testimony of President Gilman, and the professors, confirm this. In addition, several distinguished visitors from leading Eastern Universities have expressed their unqualified admiration of the convenience and excellence of th accommodations provided. It would be out of place here to enter int closer details.

We submit, that the State has received the full worth of the mone expended.

Here is a well-built and well-finished structure, one hundred and se enty feet in length, with wings sixty-five feet in depth; four stori high, containing all the modern improvements, and situated five mil from the nearest source of supplies, that has cost, exclusive of th equipment, the equivalent of ninety-two thousand four hundred an sixty-eight dollars in gold. Had it been a private undertaking, w doubt if it could have been built for much less in the same time.

MANAGEMENT OF THE FINANCES.

Excluding, for the present, the three hundred thousand dollars appr priated for the construction of buildings, which amount is paid direct out of the State Treasury, and not by the Regents, they have receive from the State, in six years, for the use of the University, the sum four hundred and twelve thousand six hundred and ninety-four dolla and seventy-nine cents. Besides this, they have received two hundre and fifteen thousand three hundred and eight dollars and ninety-thre cents, from the following sources:

From sales of lands—principal	$114,025 47	
From interest on unpaid balances	32,221 57	
From fees from purchasers	2,544 00	
		$148,791
From interest on daily balances in bank		9,753
From tuition fees		1,720
From water rates		1,074
From excess payment on land to be paid to United States		3,970
From bills payable. [This is only a constructive, not an actual receipt, and is only introduced into the account to offset the mortgage of fifty thousand dollars, which is charged as an expenditure to the account of the Brayton property.]		50,000
Total		$215,308

The total expenditures by the Regents, during their six years of se vice, exclusive, as before, of the amount paid directly by the State f buildings, have been five hundred and forty-eight thousand two hundr and ninety-three dollars and seventy-six cents.

The principal items of expenditure have been:

For salaries of President, professors, and officers		$228,826 75
For purchase of real estate, viz: the Brayton property, including the mortgage considered as paid, and all interest thereon	$113,592 45	
For the College of California property, including the block and buildings thereon, and forty acres of land at Berkeley—part of the two hundred acres forming the site	49,030 04	
For amount expended on waterworks	4,279 59	
		166,902 08
For construction of basement of Agricultural College		54,500 72
For ornamenting, grading, and improving site at Berkeley		21,151 05
For apparatus		18,974 91
For library		7,491 39
For equipment and repairs of buildings in Oakland		12,971 65
For free scholarships		4,833 33
For support of Preparatory Department		2,045 39
For architects' plans		2,965 00
For legal services		2,088 75
For rents		6,322 00
For advertising and printing		3,366 41
For supplies, including stationery		2,522 10
For insurance		1,693 18
For office expenses		1,493 45
For sundry smaller accounts—in the aggregate		10,145 60
Total		$548,293 76

If we consider the fifty thousand dollar mortgage unpaid, the actual cash expenditures in six years have been four hundred and ninety-eight thousand two hundred and ninety-three dollars and seventy-six cents. If to this amount we add two hundred and seventy-two thousand dollars expended directly by the State for the construction and equipment of buildings, it will show a total expenditure on University account of eight hundred and twenty thousand two hundred and ninety-three dollars.

And now, what have we to show for this expenditure?

First—A splendid University, of high grade and of established reputation, imparting instruction in all branches of useful knowledge, free to all comers, male and female, in successful operation.

No money consideration can represent the value of such an institution to the State.

Second—The amount paid for instruction, for free scholarships, and for support of a preparatory department, aggregating two hundred and thirty-five thousand seven hundred and five dollars and forty seven cents, has gone beyond recall.

For this we have nothing tangible to show. It is represented by the knowledge imparted to hundreds of the youth of our State. It will, we trust, bear its fruits in time, in the form of wise statesmen and legislators, accomplished scholars, original thinkers and inventors, able jurists, public benefactors, and virtuous citizens.

No mere dollars and cents can represent the value of these. But aside from the intangible blessings conferred by the University, the Regents, representing the State, have properties of great value to show for the money expended. Deducting from the total expenditure on all accounts—eight hundred and twenty thousand two hundred and ninety-three dollars—the amount paid for instruction—two hundred and thirty-five thousand seven hundred and five dollars and forty-seven cents—and we have a balance of five hundred and eighty-four thousand four hun dred and eighty-seven dollars and fifty-three cents. To represent thi the State owns:

Four blocks, with valuable improvements, in the heart of Oakland, worth at least	$150,00
Two hundred acres of land at Berkeley, worth, at a low valuation, one thousand dollars per acre	200,00
New buildings at Berkeley, thoroughly and handsomely equipped, that cost a total of three hundred and twenty-six thousand five hundred dollars and seventy-two cents, which the most unfriendly critic at all competent to judge, would, probably, value at not less than	300,00
Fifty acres of land in the suburbs of Oakland, donated by the late Edward Tompkins, believed to be worth, at present	40,00
A splendid collection of apparatus, that could not be duplicated in the United States, by private parties, for	25,00
A valuable library, containing over eleven thousand volumes, worth at least	15,00
Toland Medical Hall, in San Francisco	75,00
A museum, embracing extensive collections of minerals, works of art, etc., chief among which are the State Geological Survey collection, the Mills-Voy collection, the Pioche collection, and the Ward Series of Casts, worth, at a low estimate	35,00
Disregarding numerous less important donations, this give us properties of the money value cf	$840,00

We submit that this statement is a full refutation of the charges o carelessness and neglect made against the Regents.

We submit further, that it is conclusive evidence of the care, th ability, and the fidelity with which they have administered the responsi ble and onerous trust confided to them. Deeply interested in the ad vancement of learning, and appreciating its inestimable value to th youth of the State, and to the State itself, we have labored zealously and with an eye single to the public good, without compensation, or th hope of reward, save the consciousness of duty performed, to establish on a stable foundation, at the least possible expense, a first-class Uni versity. In this, we know we have succeeded. The consciousness o this amply repays us for our labors. If to this be added the approving voices of our fellow citizens, we shall be more than content.

Three exhibits are appended to this financial statement:

A. Receipts and disbursements to January second, eighteen hundre and seventy-four.

B. The same to February twenty-eighth, eighteen hundred an seventy-four.

C. Sales of Agricultural College lands.

[Appendix A.]

RECEIPTS AND DISBURSEMENTS

OF THE

REGENTS OF THE UNIVERSITY, FROM AUGUST 8, 1868, TO JANUARY 2, 1874.

The resignation of Mr. A. J. Moulder, as Secretary of the Board, was accepted on the second of January, eighteen hundred and seventy-four. On retiring, he asked the Board to appoint an expert to examine his books, accounts, and vouchers up to that date. In compliance with this request, the Board appointed Mr. J. Ham Harris, who has devoted himself closely to this work, and on the third of March submitted the following report of progress.

Bear in mind that this report extends only to January second, eighteen hundred and seventy-four.

RECEIPTS.

	University Fund.		
Aug. 8 and 19, 1868	Cash paid by State Treasurer to W. C. Ralston, Treasurer of the University	$45,000 00	
October 28, 1869	Cash received from sale of warrants on the State Treasurer	27,831 00	
November 10	Cash received from the State, from proceeds of sales of tide lands, on account of the $200,000 appropriated to the University	100,000 00	
August 5, 1870	Cash received from the State Treasurer by W. C. Ralston, Treasurer of University	14,450 00	
December 31	Cash received from the State Treasurer by W. C. Ralston, Treasurer of University	3,000 00	
December 31	Cash received from the State, from proceeds of sales of tide lands, on account of the $200,000 appropriated to the University	65,000 00	
May 1, 1871	Cash received from the State, from proceeds of sales of tide lands, being balance due on the $200,000	35,000 00	$290,281 00

	Amount brought forward		$290,281
	State appropriation account.		
August 26, 1872	Cash received from the State Treasurer by W. C. Ralston, Treasurer of the University, as per following amounts, authorized by an Act of the Legislature entitled "An Act to provide for the support of the University of California," approved March 26th, 1872:		
	Deficiency for March, 1872	$2,265 32	
	Deficiency for April, 1872	5,376 55	
	Deficiency for May, 1872	5,771 95	
	Deficiency for June, 1872	5,144 72	
	Deficiency for July, 1872	3,835 42	
	Deficiency for August, 1872	5,653 65	
	Deficiency for September, 1872	5,943 17	
	Deficiency for October, 1872	5,553 38	
	Deficiency for November, 1872	5,809 79	
	Deficiency for December, 1872	4,911 65	
	Deficiency for January, 1873	6,000 00	
	Deficiency for February, 1873	6,000 00	
	Deficiency for March, 1873	6,000 00	
	Deficiency for April, 1873	6,000 00	
	Deficiency for July, 1873	5,718 69	
	Deficiency for August, 1873	5,848 52	
			$85,832
	Land Fund.		
	Cash received from sales of University lands:		
	9,694 acres of land sold at $5 per acre, for which payment was made in full	$48,470 00	
	92 23-100 acres sold at $6 25 per acre, for which payment was made in full	576 45	
	Cash received from sales of land sold at $5 per acre, on which 20 per cent of the principal was paid, and the balance afterwards paid in full	16,126 60	
	Ditto, ditto, on lands sold at $6 25 per acre	2,400 00	
	18,972 28-100 acres sold at $5 per acre, on which 20 per cent of the principal was paid	18,972 28	
	14,954 86-100 acres ditto, ditto, sold at $6 25 per acre	18,693 41	
	4,031 65-100 acres, sold at $5 per acre, on which 20 per cent was paid, and payment in full made subsequently	4,031 65	
	480 acres ditto, ditto, at $6 25 per acre	600 00	
			109,870
	Land Interest.		
	Cash received from interest on land sales		24,793
	Fee Fund.		
	Cash received from land fees		2,304
	Bills payable.		
	Assumption of mortgage on Brayton property		50,000
	Admission and tuition fees.		
	Cash received from students for admission and tuition fees		1,720
	Water rates.		
	Cash received from water rents		941
	Amount carried forward		$565,742

Amount brought forward		$565,742 24
Excess payments.		
Cash received of $1 25 per acre on double minimum lands—due to the U. S. Land Office		1,839 53
Interest and discount.		
Cash, balance due from this account		9,753 39
Total receipts		$577,335 16

DISBURSEMENTS.

Preparatory Department.	
Cash paid to meet deficiencies in consequence of inability to collect tuition fees from day students	$2,045 39
Salaries.	
Cash paid salaries to President, Professors, Secretary, Land Agent, Janitor, and Messenger	219,156 75
Building Fund.	
Cash paid for construction of College building, for labor, material, etc	54,500 72
University Site Improvements.	
Cash paid for fencing, grading, ornamental trees, useful trees, and plants, in improving College grounds	20,974 50
College of California.	
Cash paid for purchase of lands, expenses of surveys, attorneys' fees, etc	49,030 04
University Water Company.	
Cash paid for construction of water ditch, reservoirs, iron pipe, etc	4,279 59
Apparatus.	
Cash paid for apparatus, freights on same, and insurance	18,974 19
Rents.	
Cash paid for rent of College buildings, Oakland, Janitor's house, and Regents' office	6,192 00
Office expenses.	
Cash paid for office expenses	1,493 45
General expenses.	
Cash paid for general expenses	7,757 57
Architect's plans.	
Cash paid for plans and specifications	2,965 00
Amount carried forward	$387,369 92

Amount brought forward	$387,36
Periodical Fund account.	
Cash paid for periodicals, etc	75
Legal services.	
Cash paid for searching title, preparing deed, etc., and special agent to Washington, etc	2,088
Library Fund.	
Cash paid for books, with freight and express charges	7,132
Contingent Fund.	
Cash to provide for payment of small bills by the President of the University	1,780
Brayton property.	
Cash paid for Brayton property, including interest on mortgage and transfers.	112,476
Equipment and repairs.	
Cash paid for equipment of rooms in College buildings, repairs of same, etc.	12,971
Free scholarship.	
Cash paid for five free scholarships	4,833
Advertising and printing.	
Cash paid for advertising in sundry papers, printing, etc	3,366
Telegraphing and expressing.	
Cash paid for sundry bills	191
Stationery account.	
Cash paid for stationery	508
Insurance account.	
Cash paid for insurance premium on buildings and apparatus	1,693
Supplies.	
Cash paid for supplies for laboratory, text books for examination, coal and wood	1,593
Materials for Laboratory.	
Cash paid for chemicals for laboratory	286
Postage Fund.	
Cash paid for postage	55
Suspense account.	
Cash paid to W. C. Ralston for advances on Controller's warrants, to pay labor of students	3,314
Cash balance on hand, January 2d, 1874	37,597
Total disbursements	$577,335

To the Regents of the University of California:

GENTLEMEN: I have made a full and minute examination of the books, accounts, and vouchers in the office of the late Secretary of the Board, Mr. A. J. Moulder, from August eighth, eighteen hundred and sixty-eight, to January second, eighteen hundred and seventy-four, and as the result, herewith submit a detailed statement of the entire receipts and disbursements during that period. This result calls for the sum of thirty-seven thousand five hundred and ninety-seven dollars and eighty-five cents ($37,597 85) in the hands of the Treasurer at the close of business on the evening of the first (1st) day of January, eighteen hundred and seventy-four (1874). The statement from the Bank of California shows this amount on deposit to the credit of the Regents of the University of California.

Respectfully submitted.

J. HAM HARRIS,
Examiner of Accounts.

SAN FRANCISCO, March 3d, 1874.

[APPENDIX B.]

RECEIPTS AND DISBURSEMENTS

OF THE

REGENTS OF THE UNIVERSITY, FROM AUGUST 8, 1868, T FEBRUARY 28, 1874.

The following is a detailed statement bringing the receipts and expe ditures up to February twenty-eighth, eighteen hundred and sevent four. It is, in effect, Appendix A, extended by the addition of t receipts and expenditures from January second, eighteen hundred a seventy-four to February twenty-eighth, eighteen hundred and sevent four.

This is the latest, and to it we refer in the body of our report.

RECEIPTS.

University Fund.	
From the State Treasurer	$306,661
State Appropriation Account.	
From the State Treasurer for the support of the University	106,032
Land Fund.	
From sales of land	114,025
Land Interest Account.	
From interest on amounts due from sales of land	32,221
Fee Fund.	
From fees on land sales	2,544
Bills Payable.	
From mortgage loan on Brayton property	50,000
Admission and Tuition Fees.	
From students	1,720
Water Rates.	
From sales of water	1,074
Amount carried forward	$614,280

Amount brought forward	$614,280 33
Excess Payments.	
From double minimum lands, due the United States	3,970 00
Interest and discount	9,753 39
Total receipts	$628,003 72

DISBURSEMENTS.

Preparatory Department.	
For deficiencies on account of inability to collect from day students	$2,045 39
Salaries.	
For salaries of President, Professors, Secretary, Land Agent, and employés	228,826 75
Building Fund.	
For construction of College building	54,500 72
University Site Improvements.	
For ornamental and useful trees, plants, etc.; also, fencing and grading, on the College grounds	21,151 05
College of California.	
For purchase of lands, expense of surveys, attorney's fees, etc	49,030 04
University Water Company.	
For construction of water ditch, reservoirs, iron pipes, etc	4,279 59
Apparatus.	
For purchases, freight and insurance on same	18,974 91
Rent Account.	
For rent of College buildings in Oakland, Regents' office, and Janitor's house	6,322 00
Office Expenses.	
For expenses of office of the Regents	1,493 45
Architects' Plans.	
For amounts paid to architects	2,965 00
Legal Services.	
For attorney's fees	2,088 75
Periodical Account.	
For periodicals	75 00
Library Fund.	
For purchase of books, freight, and expenses on same	7,491 39
Amount carried forward	$399,244 04

Amount brought forward	$399,244
Contingent Fund.	
For payment of small bills by the President of the University	1,780
Brayton Property.	
For the property and interest on mortgage	113,592
Free Scholarships.	
For five free scholarships	4,833
Advertising and Printing.	
For sundry advertisement bills, and for printing	3,366
Telegraphing and Expressing.	
For telegrams and express charges	191
Stationery Account.	
For stationery used	508
Supplies.	
For wood and coal, text books for examinations, etc	2,013
Materials for Laboratory.	
For chemicals, etc	286
Equipment and Repairs.	
For equipment of rooms in the University buildings, repairs, etc	12,971
Insurance Account.	
For insurance on buildings and apparatus	1,693
Postage Fund, etc.	
For postage stamps and envelopes	55
General expenses	7,757
Cash on hand February 28th, 1874	79,709
Total disbursements	$628,003

[APPENDIX C.]

AGRICULTURAL COLLEGE LANDS.

FEBRUARY 28TH, 1874.

From sales of land.		
9,694 acres sold at $5 per acre	$48,470 00	
346 74-100 acres sold at $6 25 per acre	2,167 15	
21,436 66-100 acres sold at $5 per acre, of which twenty per cent cash was paid, and remainder on time, and bearing interest at ten per cent per annum	21,436 66	
15,034 86-100 acres sold at $6 25 per acre, of which twenty per cent was paid in cash, and remainder on time, and bearing interest at ten per cent per annum	18,793 41	
4,031 65-100 acres sold at $5 per acre, of which twenty per cent was paid at the time of purchase, and balance afterwards paid in full	4,031 65	
Balance eighty per cent due on sales at $5 per acre	16,126 60	
480 acres sold at $6 25 per acre, of which twenty per cent was paid at the time of purchase, and balance afterwards paid in full	600 00	
Balance eighty per cent due on sales at $6 25 per acre	2,400 00	
		$114,025 47
From interest on amounts due from sales of land	$32,221 59	
From fees on land sales	2,544 00	
From excess payments of $1 25 on double minimum lands, due the United States	4,760 87	
		39,526 46
Total number of acres sold 51,023 91-100		
Total payments upon land	$114,025 47	
Add for interest	32,221 59	
Add for fees	2,544 00	
		148,791 06
Balance of eighty per cent due on sales at $5 per acre	$75,889 12	
Balance of eighty per cent due on sales at $6 25 per acre	74,774 46	
		150,663 58

RESPONSE TO THE FOURTH INQUIRY.

REPORT OF AN ENGINEER UPON THE DEVELOPMENT O THE GROUNDS AT BERKELEY.

"*Fourth*—In response to this inquiry, the following report in respe to the grounds is presented. It is drawn up by W. H. Hall, Esq., most competent engineer, to whom the supervision of the work has bee intrusted:"

To the honorable Board of Regents and President of the University of Cal fornia:

GENTLEMEN: In presenting the diagram herewith transmitted, repr senting the plan I have proposed for the development of the Universit grounds at Berkeley, I have deemed it expedient to call your attentio to the circumstances connected with their past manipulation, and to r view the leading ideas and features proposed to be embodied in the future improvement.

The first steps which were taken towards the improvement of the grounds, were made by its former managers—the Trustees of the Colleg of California, a private corporation—who in eighteen hundred and sixty five, obtained the services of Mr. Olmsted, the accomplished landscap engineer, then on a visit to California. This gentleman devoted muc time and study to his subject, the results of which were embodied in plan for the grounds, and a report, dated June twenty-ninth, eightee hundred and sixty-six, in which the full æsthetic idea of the improveme is ably reviewed.

The College of California was a private corporation, which conte plated the establishment of a modest institution, chiefly of a classic and literary nature. Two buildings, at most, were to be erected. T site embraced over a hundred acres of land, and Mr. Olmsted was aske to prepare a plan for its improvement as a park. He called the atte tion of the Trustees to the fact, that the maintenance of such a groun would be a burdensome tax upon their corporation; and advised the to create upon their ground a suburban residence neighborhood, reser ing only sufficient space for college purposes, at most but thirty thirty-five acres. His views were adopted, and his plans were forme to develop the grounds in a manner suitable for the purpose specified.

Subsequently, the land was deeded to the State, upon condition th on it should be established a University, and that the entire site shou be occupied for such purpose. Features of other elements, merged in this institution, contemplated grounds for agricultural and horticultu operations, and the tract so donated afforded the requisite space. Th the present plans for improvement are based upon an idea totally diffe

ent from that upon which Mr. Olmsted formed his scheme; involving the conception of the entire area of one hundred and fifty acres manipulated as one educational institution—the material University. The plans prepared by Mr. Olmsted, therefore, were not available for the present institution, however much suited to the requirements of the College of California they may have been, or artistic and perfect for the formation of the contemplated suburban home grounds, as no doubt, from the well-known ability of the author, they were.

I have found it necessary, therefore, to make a renewed study of the subject; substituting for the idea of a rural town, the conception of an educational park, capable of being made complete in the requisite details of agricultural, horticultural, and general scientific study, so far as nature will permit the development of such elements. I have also found it expedient to disregard, in a great measure, certain partial improvements, in the way of grading for roadways, as well as much of the planting of trees, executed during the interim, and which have evidently not been done according to any well considered plan.

Unfortunately, there is not that appreciation of the importance of prearranged and definite plans for such works, which there should be. The grounds around public buildings are regarded as immaterial accessories of the main architectural features, and not as settings to the gems, which they really are; essential parts of an harmonious whole, suggestive of its character, in keeping with the design, and promotive of its convenient and effective use. All rational improvement of grounds is necessarily founded on a due attention to the character of the institution of which they form a part; upon a thorough study of the situation to be handled, and of the climatic and neighborhood influences to which it is subjected. The situation is, of course, a natural formation, to be adapted by art to the uses required. The character of the institution governs the manipulation of the details of construction, in the grounds as well as the buildings, the allotment and adaptation of the various natural features to their specific purposes; while the climatic and neighborhood influences have an immediate and important effect upon the convenient and pleasurable use, as well as the successful improvement, of the demesne. All such improvements, however blessed by nature their site may be, must be regarded from their inception as works of art. Nature does not provide lands shaped, and drained, and planted to suit the specific purposes of man. We are to seize her salient features, and allot them, as may be best, to our definite requirements; and, while preserving her more attractive spots in their integrity, develop an intricacy, a diversity of detail, presenting a succession of pleasing situations, varied in character, yet so arranged as to be in accord with each other.

The arrangement of these grounds constitutes something more than the laying out of avenues and the planting of trees. It is in reality the planning of the material University. Neither one nor all of the buildings which are to be placed there, make up this institution in its entirety. It comprises all within the boundaries of the tract, and must be regarded as one big structure, in which the several buildings, designed as they will be for different purposes, are as rooms or wings set aside to such specific uses; superior in importance, and requiring a greater share of study in their design, it is true, but no more distinctive features to be considered than the botanic garden—for the scientific arrangement of the plants, the departments for the practice of horticulture and agriculture, or even the recreation grounds, the ramble in the woods, or the mere landscape effects. Of course, when these principal features—th main architectural works—are located, we have to adapt all else to the but where such is not the case, a considerable amount of care may we be taken in properly placing them. We cannot, however, fix or descri the situation suitable for a house, without at the same time formi some idea of the structure suited to the situation; nor should we ma an allotment of ground to any specific purpose, without consideri whether such use is to be suited to the locality.

I proceed at once to a consideration of the requisites of a gener plan for these grounds, and the attention they have received at u hands:

1. That the building sites which nature has provided be preserv for such purpose and set aside for the most appropriate occupation.

2. That suitable localities be designated for other specific purpose and developed in a manner suited to such use.

3. That the general development of the grounds be such as will pr mote the convenient use of the principal elements of the institutio and enhance the natural beauty of the site, while introducing the ar ficial structures necessary for its profitable occupation.

4. And that economy of construction and maintenance be closely a hered to and planned for.

Taking the two colleges now completed as a nucleus, there are eigh principal sites for large buildings. On this basis, I have supposed th future University to consist of a College of Agriculture, a College Letters (the two buildings now completed), a School of Mines, a Scho of Engineering and Mechanic Arts, a Museum, a Library, an Assemb Hall, and a School of Practical Agriculture and Horticulture; and placed them, as indicated, on these sites, as would seem most fittin The Library, an ever increasing element, in a locality where it will ha room to spread to a vast size, very convenient of access from withou the grounds, central to the Colleges of Agricultural Science, Letters, an School of Engineering and Arts, the pursuit of the courses of study which will most frequently necessitate reference to its volumes. Th Museum, also a growing institution, on a spot where its building may enlarged, adjacent to the School of Mines, and Engineering and Arts, which departments a great portion of the contents will have some rel tion; while the School of Practical Agriculture and Horticulture is l cated in the midst of the grounds allotted to the experimental pursu of its course; and the Assembly Hall upon the most pleasing and invi ing site, retired, yet the most accessible from the two main carriage e trances, and from the depot of the horse-cars without.

I have regarded the proper disposition of the residences of the mem bers of the Faculty as a most important element in the problem; th more so, that they are not properly features of the University itsel and should not appear in its main groupings. I find a site which h been suggested, at the southwest corner of the grounds, most fitti for the purpose; and have so developed a neighborhood as to render i occupation pleasurable and convenient, as the arrangement of the lo and houses fronting upon a litle park, and of the rear entrances a walks will indicate—the whole to be excluded from view from the ma grounds, by plantations following the general line of the back wal Of the many reasons for this location and development, I mention se eral, viz: First—The impropriety of bringing into the grouping structures, in the main portion of the grounds, an element so foreign the general tone of the establishment. Second—Opportunity for drai

age and sewerage at small expense. Third—Facility with which rear yards and offices may be excluded from view. Fourth—Accessibility by commercial travel, thus excluding the necessity for a very undesirable class of vehicles entering the grounds. Fifth—Greater neighborhood convenience, and ease of access to the occupants of the houses themselves.

A Conservatory, wherein much botanical knowledge can best be acquired, and always a pleasing and attractive feature, is located at a protected spot, where the ground about it is adapted to the cultivation of such plants and shrubs as would be appropriate in its neighborhood, and where it will present a remarkably fine effect in the principal landscapes. This feature, and the surrounding rich garden, the space devoted to economic botany—a low valley well adapted to the purpose—and the horticultural grounds on the table-land above, are all adjacent to the nursery and propagating houses, from whence they will be, in a measure, supplied with stock. The public picnic ground remains as it is, remote and sheltered, and easily arrived at from without.

The University grounds must not be regarded as a driving park. Such a presumption would soon bring about a use of them highly detrimental to the real object of the institution. Drives there will be, in abundance, in the neighborhood; one—the Piedmont Way—traversing the upper portion of the track itself, and which I have carefully planned without connection with the roads of the University, in order that such roads will not be converted into thoroughfares between the low lands and the way above. Roads, therefore, must be regarded as necessary evils in the University grounds, and only located where desirable to approach its principal features. The least measure of roadway to answer this requirement, is the proper amount to be planned. A strict adherence to the natural topography, maintaining very easy grades, and avoiding earthwork, with a width just sufficient to answer the purposes of maximum travel—from twenty to twenty-five feet—touching upon the points required to be approached by vehicles, and an observance of the rules of tasteful landscape gardening, with the requisites of good engineering principles, are the considerations which have influenced the location of these features, as embraced in my plan. Another reason for limiting the amount of roadway is found in the observance of the fourth requisite of a plan for the grounds—namely, economy of construction and maintenance. Roads are expensive to make, and expensive to keep in repair. This consideration is also applicable to walks; and therefor I have planned with a view of making these direct avenues of communication between the principal structures, as far as the restrictions indicated above would permit, except at several limited localities, where it is desirable to awaken some special interest by the development of parterres, devoted to ornamental as well as instructive horticulture and floriculture.

Gateways are offices requiring attention; a multiplication of them increases cost of maintenance, and destroys the air of security and seclusion which these grounds should have. Therefore, two carriage entrances on each the north and south sides, with one upon the west, is all that is admissible. It was proposed to locate the main entrance at the end of University Avenue; a most unfitting place, upon the side of a hill, necessitating a steep grade to surmount, or a sharp curve to avoid it, and otherwise violating the established rules of good taste and engineering. The main entrance to the University should be spacious, commensurate with the dignity of the institution, and in keeping with the general air of the grounds. The valley where I have located admits of this treatment; the end of University Avenue, as projecte does not.

Though the principles of landscape composition should govern in great measure the arrangement of these grounds, the fact that th institution is one of learning should be held in view in the developme of every portion of the lands; but the entire conversion of this beautif site into a school of practical horticulture and agriculture would be needless act of vandalism. I would, therefore, establish a series botanical studies, grounds for economic botany, the culture of frui berries, and farm produce; a forestry, an arboretum, and other instruc ive features, some of which are indicated, stocked with a variety trees and shrubs; but I would make their arrangement subservient principles governing the effect of the whole, and not a mere carryin out of botanical classification.

One other feature demands some attention: the terraces around th Colleges of Agriculture and Letters, now in course of construction.

These buildings are massive structures, set upon a formal fronta line on the gently sloping surface of a flat spur of the hills. Th occupy about the sites selected by Mr. Olmsted for the two buildin contemplated for the old College of California, as near, at least, as o can judge from the text of his report (the drawings not being at hand

Public buildings, from their stately character, obviously demand th most formal settings; and none require greater space in this treatme than those to be frequented by crowds of college boys. The plannin of this particular portion of the Berkeley improvement has been do with the view of providing suitable settings for these buildings, affor ing ample room for the throngs of scholars and their friends, who ma be expected to congregate about them at times, and introducing el ments which will heighten the effect of the general rural air of th grounds, by imparting a breadth of foreground, a charm of variety, an a contrast of the decorative art with the beauties of nature. The principal effect, from the west, will be to impart a dignity, a sense security and stability to the structures, which the preservation of th natural slope would have defeated.

The fact that a hummock of earth existed upon the hill between th two buildings, cutting off the view of one ground line from the othe has necessitated the execution of the earth work which is now in pr gress. The plan contemplates the removal of this unsightly protu rance, and the use of the material so obtained in the construction the roads and terraces in front of the buildings; while the ground their rear will be sloped back into the present fall of the hill, so as have a perfectly natural appearance on this side of the buildings. T preservation of the original slope about these buildings, with a natu treatment of the grounds up to their bases, would have been about appropriate as the location of a castellated gothic structure in the mi dle of a wide plain, or the construction of a fancy woodwork fo bridge at the base of the Yosemite Falls. There will certainly be so small area of well kept ground at Berkeley. This I have render possible to restrict to a small extent by the construction of the terrac which, being treated as such dressed ground, establish at once an app priate limit to such treatment, thus enabling the expense of maintenan to be reduced to the least amount, and avoiding the appearance whi the buildings would otherwise have—of a couple of fine structures the middle of a plowed field. In this connection, it may be well mention, that the plan submitted by Mr. Olmsted for treatment of the grounds around the two buildings contemplated by the old College of California, which, as said before, were to be located in nearly the place now under consideration, was similar in general æsthetic style to that which I have adopted, as we gather from the following paragraphs quoted from his report:

"The central buildings are intended to be placed upon an artificial plateau at the head of the dell before described. * * * The west front of this plateau is designed to take the form of an architectural terrace. * * * At the foot of these walks appropriate entrances are provided from a carriage way."

"The construction of the necessary plateau will not be an expensive undertaking, as the working plan will show, and the terrace may be finished very plainly and cheaply. At the same time, the introduction of a high degree of art at any time in the future will be practicable, in the form of statues, fountains, and a highly decorated parapet, with tile and marble pavement upon the terrace, and on each side of the broad walks, the intermediate quadrangle, and the stair and entrance way."

Though Mr. Olmsted's general plan for the grounds could not have been adapted to the wants of the University, his conception of the treatment immediately about the two central structures of his design was evidently identical in æsthetic idea with that which I have adopted, and I gladly avail myself of the above quoted paragraph, in further elucidation of this feature of the plans now submitted.

There is, probably, no established University in the world, whose grounds take so prominent a part in the general educational system of the institution as those at Berkeley may be made to perform by a judicious system of development. After the general design is fixed, and its outlines laid upon the ground, the execution of its details, performed, as they may be, in a great measure, by the students, will afford valuable practical examples of the theories taught in the agricultural, engineering, and mechanical course of study of the institution.

The expense of executing the works embraced in the ground plan herewith submitted, will, of course, be governed by the style of the detail work undertaken, which could be made to cost much or little. The expending of these moneys, after the primary works are finished, may be prolonged through a series of years. It is expedient, however, that the works necessary for the pleasurable and profitable occupation of the grounds be executed at once; and for this purpose, at least fifteen or twenty thousand dollars for each of the succeeding two years will be required.

Very respectfully, your obedient servant,

WM. HAMMOND HALL,
Engineer.

San Francisco, February 21st, 1874.

SPECIAL INFORMATION

RESPECTING

AGRICULTURAL EDUCATION

The Regents are of opinion that, in promoting the Department Agriculture, so far from showing any unfriendliness or hostility (as h been charged) toward this most important interest, they have done a that was consistent with the full discharge of the trust confided t them. They have been minutely informed of the difficulties encountere elsewhere in the solution of this problem; of the disappointments an changes which have occurred in other well-known institutions; and of th local complaints which have been uttered respecting the very Colleg and Universities whose example they are urged to follow. This ha made them cautious, but it has not made them indifferent On the co trary, they are desirous of making the University subserve to th utmost the agricultural interests of the State, as well as its other indu tries, and they will welcome all the pecuniary assistance, and all th good suggestions, which the Legislature, the agricultural societies, an individuals may contribute to this end. They beg those who are i terested in the problem to examine the catalogues, registers, and report of other State Colleges, and not rest their opinions upon vague an inaccurate rumors, or hostile criticisms.

The Regents especially request that the following points be borne i mind in judging of their work:

1. The Congressional enactment of eighteen hundred and sixty-tw giving what is commonly called the Agricultural Fund to the State, wa not the beginning of the University of California. It was preceded b the University or Seminary Grant, given to California, as to other ne States, for a University, and by the foundation of the College of Cal fornia.

2. The Congressional endowment of eighteen hundred and sixty-tw commonly called the Agricultural College Grant, was not given for mere Agricultural College, but as the law (already quoted more fully declares, "for instruction in those branches of learning which a related to agriculture and the mechanic arts"—"not excluding othe scientific and classical studies."

3. This Fund, called the Agricultural College Fund, has thus fa yielded in six years, since eighteen hundred and sixty-eight, an incom of thirty-two thousand two hundred and twenty-one dollars only, whic is about four hundred and fifty dollars per month, from the foundatio of the University. The salary of the Professor of Agriculture alone, i three hundred dollars per month, not to speak of any other instructio given, or expense incurred for the Department of Agriculture.

4. The Agricultural College or Course, was first organized as required by the State law. Its course of studies has never been diminished, or its advantages lessened. The Professor of Agriculture has been untrammeled. By the appointment of a special Professor of Chemistry, he has been relieved of the arduous work of instruction in elementary and analytical chemistry, and has thus more time at his command for special agricultural experiment and instruction. Still further improvements have been made.

5. As agricultural students were slow to present themselves, the Board encouraged the Professor of Agriculture to travel through the State, and benefit by his lectures the agricultural communities.

6. The University was not removed to its permanent site at Berkeley till September, eighteen hundred and seventy-three, three months only before the assembling of the present Legislature; so that there has been very little opportunity for agricultural work. It then became possible to comply with two requirements of the law—the establishment of a system of moderate manual labor, and the removal of the Secretary's office and residence to Berkeley. Arrangements were at once made for accomplishing both these results. About fifty students have been employed in labor upon the grounds.

7. Before deciding upon the various uses to which the beautiful grounds at Berkeley should be assigned, the Board availed themselves of all the suggestions of the Professor of Agriculture, and of the plan which he presented last year; and they also took the best advice which they could obtain from other professional and experienced sources.

Four surveys of the grounds have been found necessary, and have been made:

(1.) A topographical survey, exhibiting accurately the surface of the site—an essential preliminary to all other work.

(2.) A survey of the boundaries—to determine some very important differences of opinion.

(3.) A study of the water supplies, which are now ample, and should never be diverted.

(4.) A study of the site with reference to its occupation by the University, for all time. This required the consideration of probable building sites, roads, paths, bridges, drainage, and also the introduction of varied vegetation, and the use of the grounds for agricultural and horticultural experiment, forestry, botanic garden, etc. This survey has but recently been completed, and the report of the engineer to whom it was entrusted, is herewith submitted.

8. In accordance with the request of the Professor of Agriculture, made September eighteenth, eighteen hundred and seventy-two, he was then authorized to employ the services of a competent gardener, at the salary of one hundred dollars per month, and the resolution has never been rescinded, though no candidate for the place has ever been proposed by him to the Board. He was also authorized to proceed with the construction of a propagating house, according to his request, and the sum asked for was appropriated to build it. On the removal to Berkeley, a sum of five hundred dollars was placed at his disposal, to secure the aid of competent experts as occasional lecturers, during the year, in matters of practical agriculture. These subjects are referred to, that the good will of the Board toward the Agricultural College may be illustrated.

Complaint has been made that the lecture room of the Professor Agriculture is upon the basement floor. The Board have never receiv from him any expression of his wishes, and are sure that there is reason but his own preferences, why his lectures should not be given any other lecture room which he may prefer. These are very trifli points to bring before the Legislature and the public, but a word explanation seems called for.

9. The Board are very desirous of securing progress in the Depar ment of Agriculture, and have already, in their annual report (Decemb first, eighteen hundred and seventy-three), asked for appropriatio which would enable them to give it more efficiency. They have quested means for the improvement of the grounds, and for the emplo ment of additional teachers. They will welcome and administer wi fidelity all assistance which may be given to them for this purpos They especially desire to begin a system of experimental work, accor ing to the most enlightened plans, and to have at Berkeley illustratio of all the vegetation which the climate and soil will admit, and a m seum which shall exhibit fully the products of the soil elsewhere.

Finally, in judging of the actual condition of the Agricultural Colleg it should not be supposed that one twentieth of the income of the U versity is all that is given to that department. Everything connecte with the University—books, museums, apparatus, laboratories, ground buildings, teachers—are open to agricultural students as much as to a others. They profit, as a matter of fact, by all these advantages.

Seventeen of eighteen professors and instructors now teaching at th University, instruct agricultural students. The subjects in which the teach are not merely literary studies. Professor Carr teaches agricu ture and horticulture; Professor Rising teaches chemistry; Professo John Le Conte, natural philosophy; Professor Joseph Le Conte, botan zoölogy, and geology; Professor Soule, engineering, and Professo Welcker, mathematics; and these are the very things which a speci and purely Agricultural College would first provide, if such a scho was to be established away from a University.

In further explanation of paragraph numbered "five," as above, th following resolution, adopted by the Board of Regents, on the eigh day of January, eighteen hundred and seventy, is submitted:

"*Resolved,* That in order to extend the advantages of the Agricultur College of the University to the largest possible number of citizen and especially to persons practically interested in farming, fruit cultur wine making, wool growing, and stock raising, the Professor of Ag culture, Agricultural Chemistry, and Horticulture, shall visit, as far possible, all the agricultural centers of population in the State, and i every convenient neighborhood where accommodations can be obtaine deliver one or more lectures, illustrated, when practicable, upon subjec connected with agriculture, likely to be of the most value and intere to the people of the locality.

"In these lectures it shall be his care to disseminate such informatio derived from study, from observation, from correspondence, and fro general experience, as will be of practical use to the farmers, fru growers, and stock raisers of the State, having special reference to th imparting of valuable information upon the nature and best mode culture, of such new crops, fruits, trees, and vines (and the preparatio of their products for market), as may be adapted to the soil and clima

of California, and likely to increase the productive resources of the State.

"His course of lectures shall embrace the branches for which instruction is now provided in the University, viz., agriculture proper, agricultural chemistry, zoölogy, horticulture, geology, veterinary science, botany, rural economy, meteorology, disease of animals and plants, forestry, and all kindred subjects; it being the intention of the Regents, by the course here adopted, to transfer the Agricultural College of the University from the closet to the field, and make its instructions of practical value to the people of the State. These lectures shall be free, and public notice shall be given of the time and place of their delivery.

"During his tour through the State, the Professor of Agriculture shall carefully examine the growing crops, study their culture, noting particularly any exceptional influences calculated to injure or improve them, and communicate the results of his observations in his lectures. He shall take special pains to collect statistics of the crops, flocks, and herds of the State, and shall report them from time to time for publication.

"He shall open communication with all local agricultural societies, and, so far as possible, place his services at their disposal, and deliver his instructions under their auspices.

"*Resolved,* That the Board of Regents will take charge of and will themselves procure, as far as possible, from all quarters, at home and abroad, rare and valuable seeds, and will distribute the same, through their Secretary and Professor of Agriculture, throughout the State, to such persons as may desire to test their growth."

UNIVERSITY CONDITION

AND

MANAGEMENT.

UNIVERSITY CONDITION AND MANAGEMENT.

To the Chairman Joint Committee on the University:

SIR: When, on the eleventh instant, I had the honor of appearing before your honorable committee in obedience to a subpœna, a member (Mr. Amerman) made the following statement:

> "I suppose, so far as this committee is concerned, that they want to obtain any information that it is possible to obtain in relation to the condition and management of the University, and with which the Faculty are conversant. Without putting any specific questions, I suppose it would be perfectly in order for you to state anything that would throw light upon the subject."

In accordance with this courteous invitation, I beg leave to present the subjoined considerations:

At the outset, however, it is proper for me to premise that it is not my design to enter into the large and complicated question of University organization—for the framework of that is already provided for in the organic Act—but merely to offer certain general views regarding the University's "condition and management."

And first as to the present state of the University, with relation both to the purpose contemplated by the national land grant, which constitutes its main permanent endowment, and to the expressed desire of the people, whose benefactions, through legislative action, have been and are still necessary to the existence of the institution.

The purpose contemplated by the national land grant is explicitly set forth in the language of the law of Congress, which declares that "the fund shall be applied to the endowment, support, and maintenance of at least one college, where the *leading object* shall be—without excluding other scientific and classical studies, and including military tactics—to teach such branches of learning as are related to agriculture and the mechanic arts." True, the law, by not excluding "other scientific and literary studies," presents an opportunity for the introduction of a general scientific and literary course, but it at the same time concentrates the main force of its purpose on the industrial arts as the "leading object" of the national colleges.

This law dates back to eighteen hundred and sixty-two, and, considering the period at which it was framed, it is a notable instance of advanced educational views; for the noble and democratic theory of a people's University which shall aim at the "betterment of man's estat is a modern thought, originating not in the cloister, but in the popu heart, and even yet unappreciated by the scholastic class who, by virt of their position, are expounders of the old rather than creators of t new.

Unmistakable, however, as is the scope of the law, it unfortunatel by the generality of its terms, leaves a small opening indeed, yet su ficiently wide to have prompted, in several instances, the attempt prevent the essential aim of the Act, by converting the National C leges into literary and "pure science" schools. That is to say, the no exclusion of the general culture studies, as a secondary object, has, the obstructive ingenuity of pedantry, been made the excuse for the e clusion of that which, with noticeable emphasis, is declared to be t primary object, to wit: The practical application of science to the wa of man. I say that this looseness in the law has, in several instanc been made the occasion for the kind of perversion here spoken of waive for the moment the query whether such perversion has been tempted in the University of California); and this abuse of a grand i tent has alarmed the friends of popular, practical education. Then t able exhaustive report on University education, published by Congr in eighteen hundred and seventy, speaks of the "danger to the intere of agriculture and the mechanic arts, when confided to men unacquai ed with and wholly unappreciative of them." "The friends of agric ture," it continues, "should make sure in effecting a consolidation wi an institution of different character and aims (I waive for the mome the query whether the late 'College of California' is a case in poi that the administration of the dual institution be confided to men large, comprehensive, and impartial views."(1) But there is a yet mo decisive and authoritative expression of opinion respecting the vi object of the national grant, for industrial schools, in Morrill's new ag cultural college bill, now pending before Congress. For it is decla that this has been rendered necessary, in order to correct just the ki of abuses spoken of, and to ensure good faith. "If," says the bill, " shall at any time be made to appear to the Secretary of the Interior, unequivocal evidence, that any State or Territory has not in good fa substantially complied with the provisions of the Act named in the fi section of this Act, as to the use, object, and purposes therein conte plated, he shall at once duly notify the Treasurer of the United Stat who shall thereafter withhold the payment of any interest which m have accrued or accrue to any colleges in such State or Territory, un such time as the Secretary of the Interior shall be satisfied as to compliance with the provisions of said Act, and shall so notify t Treasurer aforesaid." The University of California is deeply interes in the success of this bill, for it would, in case it could be shown t the institution has faithfully complied with the provisions of the A in making agriculture and the mechanic arts the leading object, add o thirty thousand dollars per annum to its permanent endowment; bu waive, for the moment, the query whether such compliance could shown by the Board of Regents of the University of California.

In regard to this new bill, and the attitude which the scientific d trinaires hold thereto, the eleventh annual report of the Massachuse Agricultural College (eighteen hundred and seventy-four) says: "Ma of the leading educators [*i. e.*, individuals in leading educational p

tions], who seem to have hitherto regarded these new institutions with silent contempt, have become alarmed at their rising importance, and Presidents of the Universities, both old and new, appeared at the Capitol, in person or by letter, to remonstrate against the proposed action of Congress." (Here, too, I waive for the moment, consideration of whether the President of the University of California was one of those "remonstrants.")

With this much of consideration of the purpose contemplated by the national land grant for Agricultural and Mechanic Arts Colleges, I have now to take up the correlative question, What is the wish of the people of California touching the University, which they are taxing themselves to sustain?

On this head, there is, happily, no room for doubt. The memorial now before this Legislature—a memorial behind which stands the imposing and voluminous figure of the two great producing classes, to wit: the agriculturists and artisans of this State—voices with no ambiguous utterance—the passionate and irrepressible desire for a University of the people, by the people, for the people. Says the memorial:

"Believing that the first and highest employment of men is to feed, shelter, and clothe the world, we ask that the graduates of our industrial colleges may be peers of scholars in mental culture, and peers of manual skill and physical development. Agriculture, in its various departments, should be so taught and practiced in our University, as to send forth scientific farmers, whose labor and skill can utilize the soil and develop its greatest resources, while the mechanical department should graduate learned and skilled mechanics; *and it is the earnest desire of the agriculturists and mechanics of this State to make these great departments of industry the leading features of our State University.*" (1)

These ringing declarations, which, to my mind, add a new dignity to the industrial vocation, methinks they are the voice, as of many waters, of the people, who come up to this Capitol to demand that their great intent be not obstructed, but carried out; and I most respectfully leave with your committee to decide whether this majestical array is to be waived away by the shrunken figure of a college President discoursing scholastic platitudes about the suppositious "failure" of the people's glorious aspiration!

If, in this presentation of the claims which the National Government as well as the people of California have on the University, I have, as is probable, obtruded on your committee facts and views already familiar to you, it is because it has seemed to me that they are sometimes left out of sight, and because they are the necessary preliminary to the statement of the actual condition of the University in relation to its fundamental aim and purpose. This is the cardinal point in your inquiry, and I now proceed to answer it, premising, however, that matters, as well of theory as of fact, will have to be taken into account.

As regards the past—I have stated in my testimony that probably the Board of Regents of the University has, in the matter of industrial education, acted as well as could be expected of a body constituted as it is. According to their "lights," the members have doubtless aimed at the best interests of the University. There have been, again, many obstacles to the carrying out of the original intent of the University, such as the recentness of its organization, its late change of location, etc. These should have a *due* weight; and yet I venture to declare, not an *undue* weight—for many of the State institutions, the recipients of the national grant for Agricultural and Industrial Colleges, that are no older than the University of California, have already planted things like to last, in the establishment of practical schools, which, by their signal success, have demonstrated that the national grant was founded in the largest wisdom. This question, however, of what the Regents have done or have left undone, is a question apart; the answer to which may be left to their own consciences. Meanwhile, the main, vital, overshadowing question is, what is *now* the theory of the managers of the University regarding practical education, so far as that theory, design, purpose, and intent, may be gathered from the published utterances thereanent?

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(1) Report on Education, by Dr. J. W. Hoyt, U. S. Commission, p. 152.

(1) Memorial of California State Grange and Mechanics' Deliberative Assembly on the State University, p. 8.

On this subject, the most salient and memorable exposition was made by President Gilman in his address before the Legislature. He said, after stating the scope of the University, that, "If inquiry should show that the friends of agricultural education, under the most favorable circumstances, were disappointed, or that their hopes had been abandoned, California should avail herself of this experience, and before incurring radical change or expense, ascertain the lessons of experience elsewhere."

It will be noticed here that the failure of industrial institutions is made not declaratively, but by hypothesis. Yet, that President Gilman wished to leave the impression that agricultural and mechanic arts colleges are failures, is sufficiently evidenced by the fact that he proceeds to array all the supposed "disappointments" and "abandonments of hope" by "the friends (?) of agricultural education," citing the Agricultural Colleges of Massachusetts, New York, Iowa, etc., as instances. And to reinforce this impression, a compilation of all the dismal jeremiads over the supposed failure of these schools, has recently been made by the same hand, printed, and laid on the members' desks. I cannot refrain from saying that it is difficult to conceive any adequate motive for this wholesale perversion of the truth. The progress, success, and benefits of the industrial Universities and colleges founded by Congress to promote agriculture and the mechanic arts, considering the means employed, the recentness of their establishment, and the obstructions put in their way by the caste prejudice of the classicists and scientific schoolmen, have been far beyond that of any other higher institutions of learning in the country, and form, indeed, the most inspiring educational fact of the nineteenth century. I need only refer you to the last report of the National Department of Agriculture for information touching the progress of the colleges enjoying the Congressional grant. This document presents a most gratifying exhibit of the thirty-two State Agricultural and Industrial Colleges, which are attended by more than three thousand students, a large portion of whom are pursuing agricultural and mechanical studies, and are under the care and instruction of more than three hundred and fifty professors. On this head, I respectfully refer to an admirable resumé of the success of these institutions, contained in the recently published report of the Committee on Education in the California Legislature (see pp. 4, 5).

But, aside from the demonstrated fact of the success of these establishments, I cannot refrain from asking what *a priori* reason exists for supposing that they should be a failure, if under the conduct of men hospitable to the great cause? In various departments of human activity, it is recognized that pure science must be brought down into contact with professional pursuits; and it is conceded that only special schools can perform this work. That there is a point of contact between pure mathematics and the art of navigation, is made manifest by the fact that the Federal Government sustains a naval academy for the training of skilled officers in a special branch of the public service, and a military academy to fit men for another service, to wit: the profession of arms. Medicine, I believe, is not taught in the abstract, but in theaters of anatomy and the clinics of the hospital; and law schools seem to be successful just in proportion as they bring the exposition of pure principles in relation with the methods of actual procedure.

Now, is it to be supposed that in the exploitation of the productive forces of nature, there is no room for the practical applications of science, taught in schools in which theory is brought in contact with practice and experiment? Is the boasted Baconian method which makes "fruits" (that is, practical results) the test of sound philosophy, a mere delusion? It is a fact which legislators would do well to take into account, that as in the case of about one half the whole number of the globe's inhabitants, the chief occupation is the tilling of the soil, and further, that as in all civilized countries another large part of the population is in the diversified forms of mechanical industry, engaged in the fabrication of products useful to man, agriculture and the mechanic arts necessarily form the real basis of a nation's wealth, prosperity, and happiness. If between science and these divine creative functions of humanity there is no connecting link, and lawyers, doctors, and priests alone are privileged to draw from the upper reservoirs, then, indeed, may thoughtful men well begin to inquire if science is not out of joint.

But on this score speculation is superseded by fact. The National Government, acting on the faith of a great and beneficent idea, sought in the so-called Agricultural College Bill, to elevate industrial pursuits to the rank and dignity of the so-called learned professions. The conviction had long prevailed that our higher institutions of learning did not confer upon these pursuits equal advantages with the old "professions," and the idea of training young men in the direction of these pursuits, of putting brains into these industries, gained ground, and was embodied in the Act of eighteen hundred and sixty-two. And everybody but President Gilman, believes that the experiment, wherever fairly and honestly tried, has been a most gratifying success.

In this view, I cannot but think it lamentable that cultured gentlemen of the Board of Regents should have come before your honorable committee (as the testimony shows they have done), to cast ridicule on the popular desire that the application of science to the great practical interests of life, shall receive in the University that consideration which the law demands. The reasonable wish of the people that some definite effort shall be made in the direction of agriculture and the mechanic arts, is met by the flippant query: "Do you wish us to teach your sons to 'plow' and 'harrow,' to 'peg shoes' or 'set up steam engines?'" Surely, in view of the weighty interests at stake, there never was made a more melancholy use of the *reductio ad absurdum*. And it is the more melancholy from the fact that the triumphant iteration of this argument shows that in place of being a mere piece of badinage it is a significant revelation of the actual attitude of these gentleman towards the mighty modern problem of the renovation of education into conformity with the broad facts of American politics and sociology. What a proo of the survival of that scholastic feudalism which regarded the learned professions as something in which inherent dignities and proscriptive rights that the tiller of the soil, and the "base mechanical" should be frowned on for claiming!

These revelations of the attitude of President Gilman towards the claims of industrial education cast a vivid retrospective light on a series of changes which soon after his accession was made in the organizatio of the University—changes made, too, without the advice or consent o the Faculty, and which I feel free to say a majority of the member regard as most impolitic, if not illegal. The nature of these changes I now proceed to indicate.

It is well known that the organic Act provided, in the organization o the University, for the establishment of certain colleges, to wit: A State College of Agriculture, a State College of Mechanic Arts, a State College of Mines, a State College of Civil Engineering, a State College of Letters, etc. The same Act required that the College of Agriculture should be first established, the College of Letters being already in existence as an heirloom of the old College of California.

Upon this basis the University was organized, and went into operation September, eighteen hundred and sixty-nine. The first Registe (eighteen hundred and seventy) explicitly enumerates these colleges as the constituent members of the University, and states that "each college confers a proper degree at the end of the course." It is true tha this organization was in part an ideal one, seeing that de facto neither the College of Mechanic Arts, nor that of Mines, nor that of Civil Engineering, was in existence; but the plan was at least in accordance with law—a curriculum was drawn out for each college, and only the filling of certain chairs was requisite in order that they might pass from the realm of the ideal into that of the real.

The Register of eighteen hundred and seventy-two–three—the first after the accession of President Gilman—was to the Faculty the first revelation of a complete transformation in the organization of the University. While the College of Letters remained, the four other colleges had, to all appearance, become disincorporate, one common curriculum of science being substituted therefor, and only certain special "scientific studies" remaining, as ghostly reminiscences of the College of Agriculture, College of Mechanic Arts, College of Mining, etc.

The last official exhibit of the organization of the University, in the proof-sheets of the forthcoming Register for eighteen hundred and seventy-four, shows the University to consist of (1) a "Faculty of Science," (2) a "Faculty of Letters"—agriculture, the mechanic arts mining, etc., still flitting vaguely as "special courses" in the "Department of Science."

It is true, that the change thus effected is one rather of nomenclature than of fact, and it would be of no special import were there collateral assurances that the intent of the managers of the University looked t a faithful carrying out of the law; but, taken in connection with the recent persistent championing of the theory that the University shoul be a literary and "pure science" school of the Connecticut type, and with the statements that the experiment of practical education is a dismal feature, the change of name gathers a most pregnant significance.

One of the most unfortunate results entailed by this merging of the individuality of the "colleges" composing the University is, that takes away the reasonable ground of demand for professors and lecturers to carry on the full curricula of said colleges. So long as the cadre or framework of these several colleges remained, the Regents could point to vacant chairs, and, with justice, ask the people for means to fill these chairs; but as it now is, one professor would seem to be fully adequate to the instructional demands of any mere "special course" in the department of science.

In may now be in place to state briefly what is actually doing in agriculture in the University. And on this head, it is proper to mention that the latest Register is scarcely a trustworthy guide, for the imposing display therein made is rather an ideal to be worked up to, than an accomplished, or even a possible fact. The work actually done in the "specialty" of agriculture consists exclusively of didactic exposition in the class-room, to wit: five lectures per week, on the subjects of agricultural chemistry, agricultural botany, etc; and as these subjects are in the hands of an able and experienced professor, the instruction cannot be other than valuable; but as an "Agricultural College," this can hardly be deemed a shining success.

In contrast with this meager performance, and as an exemplar of what should be done in California, the mode in which other institutions founded on the national grant for the establishment of agricultural and industrial colleges, have carried out the "leading object" of the Act, is most instructive. In the recent official printed "Statements" of the Regents to your committee, they say that they "beg those who are interested in the problem [of agricultural and industrial education] to examine the catalogues, registers, and reports of other State colleges, and not rest their opinion upon vague and inaccurate rumors, or hostile criticisms." This suggestion is most appropriate; for such examination, while bringing some mortification by the contrast of the little we have done with the marvelous practical success of these institutions, will afford both a spur to our effort and a standard for our aim.

For this purpose, an examination of the Registers of the Agricultural Colleges of Massachusetts (at Amherst), and of New York (Cornell), will amply suffice.

In the Massachusetts Agricultural College, the following Faculty appears, in the specialties of agriculture:

Professor Clark, Professor of Agricultural Botany and Horticulture.
Professor Stockbridge, Professor of Agriculture.
Professor Goessmann, Professor of Agricultural Chemistry.
Professor Cressy, Professor of Veterinary Science.
Professor Packard, Lecturer on Useful and Injurious Insects.
Professor Dickenson, Lecturer on Rural Law.
S. T. Maynard, Gardener, and Assistant Professor of Horticulture.
J. C. Dillon, Farm Superintendent.

Says the last Register of this institution: "Every science is taught with constant reference to its application to agriculture and the wants of the farmer. The instruction in agriculture and horticulture includes every branch of farming and gardening which is practiced in Massachusetts, and is both theoretical and practical. Each topic is discussed thoroughly in the lecture room, and again in the plant house or field, where every student is obliged to labor six hours per week." The number of students last year was one hundred and thirty-nine. In regard to the success of the institution, the report continues: "The institution has been blessed with its usual prosperity, and has accomplished much good. The farm and stock have steadily improved, and some agricultural experiments have been carried on with interesti and important results. There are hundreds of influential men who, li the lamented Agassiz, were, for years after its incorporation, entire sceptical in regard to the possible utility of such an institution, but wh are now ready to unite in his magnanimous confession that he had bee mistaken, and was glad to be convinced of the fact, and that the co lege was a complete success, and worthy a place among the scienti institutions of the world."

Cornell University, which was established with the same gener aims as the University of California, affords a still more interesti instance of the position which agriculture holds in one institution whi shared the national land grant for Agricultural Colleges. Cornell U versity consists of a congeries of colleges, just as did our own Universi until the recent remodeling. One of these colleges is a College Agriculture. It has a Faculty consisting of eight professors and t lecturers, and these professors and lecturers are engaged, purely, special instruction in agriculture. The President of Cornell might hav put down the thirty or forty other professors, who are engaged in th various departments of University work, as swelling this list; but him, evidently, had not occurred that ingenious theory—the inventio of the President of the California University—which makes the teache of all branches of learning Professors of Agriculture; a theory, b virtue of which the Regents, in their recent "statements," are able claim that "seventeen out of the eighteen professors and instructo now teaching at the University," are teachers of agriculture.

As your committee have asked for special information on this subjec I beg leave to state that the lectures and exercises in the Agricultu College of Cornell University comprise the following subjects:

1. The *Chemistry of Agriculture*, including the constituents and analy ical composition of soils and of cultivated plants, the constituents an chemical agencies of the atmosphere and of water, and the compositio of manures.
2. The *Geology of Agriculture*, including the formation of soils, the chemical, physical, and economic character, their suitability for differe kinds of crops, and the principal geological features of various portio of the United States, as affecting the soils and productions.
3. The *Physics of Agriculture*, including meteorology, or the laws climate, and light and heat, as influencing plant life.
4. The *Mechanics of Agriculture*, and their application to the vario descriptions of implements and labor required on the farm.
5. The *Botany of Agriculture*, including structural botany, vegetab physiology, vegetable pathology, and a knowledge of crops cultivate for food and for technical purposes.
6. The *Zoölogy of Agriculture*, including the habits, diseases, an treatment of live stock, the anatomy of the horse, the cow, the shee and other farm animals, and all branches of veterinary surgery an medicine, as well as a special consideration of insects injurious to veg tation.
7. The *Economics of Agriculture*, including the sequence of agricu tural operations, the economical division of labor, the rotation of crop the improvement of the soil by manuring, draining, and liming, far engineering and construction, general agricultural policy, and the ma agement of landed property.

I venture to believe that your committee is now in position to reali not only how far the University of California is behind the other "N

tional Colleges" in respect of this great phase of practical education, but also to how considerable a degree the institution has, during the incumbency of President Gilman, lapsed from the promise of two years ago.

Two years ago the University had an Agricultural College, so named and announced in the official programmes of the institution. Now, there is no Agricultural College—not even the theory of one; but in its room a "special course" not essential to any degree conferred by the University.

Then, the agricultural graduate received for his four years' study a diploma equivalent in value to that of the College of Letters, and bearing the signatures of all the professors whose instruction he had enjoyed. Now, the agricultural graduate receives an inferior style of diploma, signed by two or three professors, while with puzzling inconsistency it is claimed that nineteen twentieths of the University instruction is enjoyed by the students of agriculture!

Then, students were directed towards the Agricultural College as intended to give special training in agriculture, as the law provides. Now, the whole scheme of industrial education, as fostered by the National Government in past and prospective action, and as understood and successfully carried out in the several States almost without exception, is held up to the people of California, and to the youth who should be directed and encouraged into industrial callings, as an ignominious failure, or a Utopian dream.

Then, one of the buildings was designed, named, and dedicated the Agricultural College. Now, the same building is in the University Register designated the "South College," or the "College of Science."

Then, a noble suit of rooms on the main floor of the Agricultural College building was, by mutual agreement among the members of the Faculty, and without objection from the Regents, assigned to the Professor of Agriculture for the special uses of his department. Now, by an act of the President, or the Advisory Committee, or both, this department is grounded in the north end of the basement of said building, where want of sunshine prevents the exhibition of important operations, and where collections are exposed to mould and dampness. (1)

Then, the University was in position to avail itself of the further endowment of Congress, as provided for in Morrill's supplementary bill, which would add at least thirty thousand dollars per annum to its income. Now, it is not legitimately within the provisions of the new endowment (since the institution has no longer an Agricultural College, but only a "special course"); and if the present executive head of the University should bear to the Secretary of the Interior his ample accumulation of the "failures" of the national schools, and the proof of his metamorphosis of the State Agricultural College into a "special course" in a "subdivision" of the "Department of Science," as evidence of honest compliance with the law of eighteen hundred and sixty-two, it might be matter of pleasant speculation whether or not the Secretary of the Interior would be able to say unto him: "Well done, good and faithful servant."

Then, the number of agricultural students was increasing. Now, it is diminishing. And, indeed, this is to be expected, for why should students seek instruction where there is neither land in cultivation, nor stock, nor any other material for illustrating practical agricultur where they graduate from a "course" instead of a college, receive diploma which excites their anger and contempt, which lacks the si natures of revered and beloved teachers, while the prestige of hono and dignities is reserved for aspirants for "intellectual" callings?

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(1) President Gilman has stated that this was done by action of the Faculty. I have never seen a single member of that body who ever heard of the proposition.

The length into which I have been necessarily drawn by the exp sition of the shortcomings in the Agricultural College, precludes an considerable discussion as to the College of Mines, the College of M chanic Arts, etc. And, indeed, I am saved the need of any discussion the subject, by the fact that these colleges do not even exist.

I shall now (at your invitation) present a few considerations regar ing the Board of Regents and its relations to the people and the Fa ulty.

These relations, in my view, are neither sound nor healthful. A Boar of Regents of twenty-two members, which is in a large degree self-pe petuating, and which is required to render an account of its stewar ship but once in two years, local in its character, interests, and associ tions, and made up almost exclusively of lawyers and other profession men, is almost, of necessity, disqualifed from an unprejudiced handlin of the question of popular education in its broadest aspects. Such guild becomes, in spite of itself, a solidarity of resistance to the pop lar demand, which, however crude, always tends toward reason an justice. I believe this Board has done as well as would any other Boar so chosen and constituted. Many of its members I personally respe and honor, while I honestly differ from the educational views to which as a body, they are, no doubt, honestly committed. Does not the his tory of nearly every college in the country show that these governin Boards, growing more and more arbitrary and conservative, have to b swept away and replaced by others more in harmony with moder progress.

What is the remedy? One remedy that is proposed, is the reorgan zation of the Board of Regents, so as, while leaving the present six e officio members, to substitute for the other sixteen Regents, eight mem bers, two from each Congressional district, the term of service bein four years. This plan, which would secure the representation of th different sections and interests of the State, finds favor with the legi lative Committee on Education, who in their recent able report th express themselves:

"We are of the decided opinion that no State educational institutio such as the University of California is designed to be, can be as pros perous and useful under the control of local men and interests, as whe under the combined control of men representing the varied callings, in terests, and sections of the entire State. The proposition, it seems to us answers itself, and does not admit of discussion. We believe that suc a change would greatly advance the best interests of the University."

Whether the eight members should be elected by the people or hol under executive appointment, is a matter of detail. In whichever wa created, such a Board could not but be in sympathetic relations wit the people of the State. I add that this method prevails in many of th Western States.

As regards the relations between the Regents and the Faculty, I a aware that I am touching on delicate ground; but I have seen faithf and honorable men, and that within a few days, placed in a positio far more delicate, where a full and free utterance of their own con victions was morally impossible, without personal risks, which me

with families dependent upon them do not care to run, and when the general interests of the institution, which they have learned to love with an almost parental sentiment, seemed to require their silence. Nevertheless, I think that truth and honor demand an outspoken expression of opinion on my part, for I am not prepared to accept that new definition of treason which makes it consist in doubting, for a moment, the infallibility of the Board of Regents, as to the whole theory and practice of University education.

I feel bold to say that the University of California cannot rest on a sound foundation until there is a rational readjustment of power between the Regents and the Faculty. The relations of the Faculty to the Regents have become more and more those of "employés" to an employer, while the relations of the Regents to the people seem to be less and less those of employed and employer. And between Faculty and Board there is indeed nothing like correlation of rights. The greatest discovery of modern political science is the introduction of checks and balances, as guards against the absolutism of power lodged in the hands of any single body. But, with no power in the hands of the Faculty and all power in the hands of the Regents, there has ensued the necessary consequence—timidity on one hand and despotism on the other. In this state of affairs, a President, however willing to voice the Faculty, would, from the very constitution of human nature, be sure, in the long run, to go where power lay. I believe that President Gilman has been acute enough to see this, and to act accordingly. Now, if in this state of affairs, we suppose a President to have some special educational "crank," bias or prejudice (say opposition to industrial education), being wholly independent of the Faculty, he might, by assiduous court paid to the Regents, succeed in bringing them over to *his* "policy," and thus in placing the University in an utterly false position.

It is, in my opinion, precisely through this train of circumstances that the Board of Regents and the University have, by President Gilman, been placed in the present lamentable position of antagonism to the popular educational demands. It is only unfortunate that honorable and high-minded men should consider it matter of pride to maintain this attitude, and at the slightest suggestion of criticism, form a circumvallation of defense around the privileges of their guild for the odd contradictions of fact and logic into which they have thus been precipitated are hardly less amusing than pitiable.

The entire energies of this Board and the President are directed to prove:

That Agricultural Colleges are failures.	That the University has an Agricultural College *now*, and that the Regents are devoting nineteen twentieths of the University income to its development.
That there is no demand for agricultural education—*i. e.*, that the University has no agricultural students.	That, of the eighteen professors and instructors, all but one are engaged in teaching agriculture.

That the only reason why agriculture is not taught *practically*, is want of means.	That the legislation asked fo the memorialists to secure means ought not to be granted
That the Agricultural Professor is inefficient.	That his urgency in behalf agricultural education is disloya to his employers, and requires he be made an example of to doers.
That the management of the University demands eleven eminent lawyers to secure its success.	That these lawyers are u quainted with the statutes resp ing the University.

I have said that the remedy for the kind of evils here spoken of i be found in the rational readjustment of power between the Faculty the Regents. In any such plan, there are two desiderata that sh certainly be secured:

1. Legislative action that shall make the summary removal of a fessor impossible, by providing that such removal shall be only cause, and after fair trial. The justice of this measure is obvious, what man of superior talent will dedicate his life to University inst tion without other guarantee than the pleasure of a Board of Regents? is not an agreeable thing to lie down to rest a University professor, an find in the morning paper that your chair has been vacated, without no or reason alleged. Nor is this an imaginary case; it happened th years ago, in the instance of a professor in the University of Califor and sent a thrill of horror and shame throughout the world of lett That such an outrage was possible in a civilized country in the teenth century, is ample reason for demanding that *law* shall regu where *honor* is silent.

2. Legislative action that shall place in the hands of the Fac the power of annually choosing from their own number, one, who addition to his professional duties, shall act as executive officer, or Pr dent of the University. This is the plan devised by the wisdom Jefferson for the University of Virginia (in which institution it has in successful operation for over three quarters of a century), and wh has been adopted by various modern Universities, such as that of bourne. The advantage of this method, on the score of economy obvious, but, to my mind, it has another advantage stlil more import As I said in my testimony before you: "Such an officer, being annu elected by the Faculty and responsible to that body, is in a posit analogous to that of an English Prime Minister, since he may be pas on with regard to confidence or want of confidence." It is, in effec self-adjusting arrangement, whereby, in the event of a President ce ing to represent the best interests of the University, he would be movable before his influence could seriously damage the institution. had been happy, indeed, for the University of California, had there such a safeguard against the mischief of an executive officer, who, w a person of respectable attainments and untiring industry, is, both training and temperament, simply incapable of grasping either grandest phase of modern education, or the practical wants of the people of California.

Very respectfully,

WILLIAM SWINTON,

Late Professor of the English Language and Literature in the University of California.

EXHIBIT A.

WHEREAS, Professor Swinton has misinterpreted the expression of feeling, tendered him by the students on March eighth, eighteen hundred and seventy-four, and is using the same to the detriment of the institution; and whereas, the resolutions adopted were not the unanimous sentiment of the students;

Resolved, That we, the students of the University of California, do, as a body, disclaim any sympathy with, or approval of, the course pursued by Professor Swinton at the State Capitol, tending, as it does, to weaken and impair the usefulness of the University.

Resolved, That we express to President Gilman, and to the honorable the Board of Regents, our sympathy with them, and our gratitude for the fidelity with which they have labored for the improvement of our Alma Mater.

Resolved, That we express to the public at large our belief that President Gilman is our true friend—that he has been the chief motive power, which has brought the University to its present state of efficiency, and tender him our thanks, assuring him, in common with all other working friends of the University, of our earnest coöperation.

Be it also resolved, That copies of these resolutions be transmitted to the Board of Regents, the Faculty, Speaker of the House, President of the Senate, committees of the Assembly and Senate on University, and to the leading papers of Oakland, San Francisco, and Sacramento.

E. A. Parker and J. R. Farrell, seventy-four; J. F. Alexander, seventy-five; J. E. Taylor, seventy-six; D. B. Fairbanks, seventy-seven.

A. C. BRADFORD, JR.,
Secretary.

EXHIBIT B.

1. Is the instruction given by any professor to agricultural or mechanical students essentially different from that in the College of Letters, or from that usually given in literary or scientific colleges, not intended to fit farmers and mechanics for their pursuits?

2. Has the manual labor system, as far as practiced, any connection with education in agriculture, mechanic arts, civil engineering, or horticulture, and landscape gardening?

3. Has the change in organization from an Agricultural College course of study, as appears by comparison and soforth, of former repo and Registers of the University with the latest, been made on the rec mendation of the Faculty or Academic Senate?

4. Are you willing to state, with such facts before you as are common property of the whole country, whether a reasonable ef has been made to comply, in good faith, with the conditions of Congressional grant of eighteen hundred and sixty-two, or with organic Act itself? If not, are the Faculty, or any one of them, sponsible for the same?

5. Are you willing to state whether, in your opinion, the interests the University require that the Faculty should take a more respons part in its management?

6. Would it promote the harmony and efficiency of the University give the Faculty the power to nominate their presiding officer, and a longer or shorter term, to arrange its courses of study, and prov such assistance as they may require in their several departments?

EXHIBIT C.

1. The Faculty reply to the first question, Yes. The instruct given by Professor Carr is chiefly agricultural. Besides, the course mathematics in the College of Mechanic Arts, is more extensive th that of the College of Letters. Special instruction in the chemi laboratory is also given to agricultural students. Latin and Greek not taught in the Colleges of Agriculture and Mechanic Arts, but time is devoted to modern subjects.

2. To the second question the Faculty reply, that the work undertaken to improve the grounds. The students were employed order to give opportunity to make money in this way. Advantage taken of these facts by the Professor in Engineering to give practi instruction in that department.

3. To the third question the Faculty reply that, in their judgme no change in organization, such as is referred to in the inquiry, been made or attempted to be made. The changes of arrangem in the Register, which was considered as merely incidental, were chiefly to those who had the editorial supervison of the Register, the President and the Dean, who were not aware of any objections the part of any member of the Faculty.

4. In answer to the fourth question, the Faculty would say, they think a reasonable effort has been made.

5. The Faculty would reply to the fifth question that, in their j ment, the present relations to the management of the University substantially satisfactory.

6. In answer to the sixth question, the Faculty would reply in negative, assigning, as one reason, that the duties imposed by organic Act on the President, are of such a nature that they cannot performed by the Chairman of the Faculty, doing full work as a fessor.

EXHIBIT D.

Oakland, (Cal.), March 17th, 1874.

To the Secretary of the Board of Regents:

Dear Sir: Near the end of last week I received a communication, anded to me through the Deputy Secretary of the Regents, from the Hon. T. H. Laine, requesting the answer of the Faculty to certain ques- ions propounded by the joint committee of which he is Chairman.

It was too late to secure a Faculty meeting last week, but as early as ossible this week a special meeting was called, and the communication was laid before the Faculty. They held an adjourned meeting to-day Tuesday), and adopted, unanimously, a series of replies, which are ransmitted herewith.

You will please to forward these replies to the Hon. Mr. Laine, and give him the reason for the delay.

Please also to state that all the members of the Faculty were present, with the exception of Mr. Ogilby, a non-voting member. Those who were present, were President Gilman, Professors Carr, Kellogg, Jno. Le Conte, Jos. LeConte, Pioda, Rising, Soulé, and Welcker, Assistant Pro- essor Bunnell, and Instructors Allen, Edwards, Grossman, Hawkins, nd Phillips.

It may be proper to add that President Gilman retired before the con- ideration of the last two questions.

I am yours, truly,

MARTIN KELLOGG,
Dean of the Faculty.

TESTIMONY

TAKEN BY THE

Special Committee on Central Pacific Railroad Matters.

G. H. SPRINGER.........STATE PRINTER.

TESTIMONY.

THURSDAY, March 5th, 1874.

TESTIMONY OF ALBERT HART.

Albert Hart was sworn, and examined as follows:

Mr. Amerman—You are the Secretary of the State Board of Examiners?

Answer—Yes, sir.

Question—All claims of Sheriffs of the different counties, for transporting prisoners to San Quentin, and insane patients to Stockton, come before that Board, I believe?

A.—Yes, sir.

Q.—During your connection with that Board, as Secretary, has it, or has it not, been the custom of the State to pay all claims of Sheriffs for transporting these prisoners and insane persons?

A.—It has been the custom, as far as my knowledge goes.

Q.—So far as your knowledge goes, have claims of this nature been presented and allowed, on behalf of the Sheriffs of this State, generally?

A.—They have thus been paid.

Mr. Burt—Has there ever been any reduction made by Sheriffs, or the Board, on account of free passage over the railroads?

A.—No, sir.

Mr. Coggins—Has the question been raised in the Board, with regard to Sheriffs transporting these persons over the Central Pacific Railroad Company's road free of charge?

A.—Not to my knowledge.

TESTIMONY OF B. D. DUNHAM.

B. D. **Dunham**, sworn and examined:

Mr. Amerman—Mr. Dunham, I believe you have been Sheriff of Placer County?

Answer—Yes, sir.

Question—How long since you were Sheriff?

A.—From March, eighteen hundred and seventy, to eighteen hundr and seventy-four.

Q.—During the time you were Sheriff, did you convey prisoners San Quentin, and insane persons to Stockton?

A.—Yes, sir, a good many.

Q.—When you thus conveyed those prisoners and insane patients, di you pay their fare?

A.—From Sacramento, I did; they were passed free from Auburn t Sacramento.

Q.—Auburn is the county seat of the County of Placer?

A.—Yes, sir.

Q.—Between Auburn and Sacramento you paid no fare?

A.—No, sir.

Q.—Between Sacramento and Stockton, and Sacramento and Sa Quentin, you paid regular fare?

A.—Yes, sir.

Q.—Were you cognizant of an Act passed April fourth, eighteen hun dred and sixty-four, with regard to the conveyance of prisoners and in sane persons?

A.—I remember the railroad Act. I don't remember the date of it. suppose it was the Act of eighteen hundred and sixty-four. I have rea one or two Acts with regard to the railroad company, but don't re member the dates of any of them. I have read the part with regard t the passing of insane and prisoners over the road. I don't recollect th date of the Act.

Q.—Have you any knowledge with regard to the provisions of tha Act, as to prisoners and insane?

A.—My opinion was, that they would pass them free to Sacramento- to the end of the road. I read the law in regard to it, to satisfy mysel whether I had not the right to demand that they should take them clea through. I didn't quite know whether this was the end of the road o not. I understood it was considered as the end. I thought that whe they extended the road, they should take them further free. I tried i once or twice, but failed.

Q.—In taking prisoners to San Quentin from Auburn, when you ar rived at Sacramento, what route did you take?

A.—Generally the Oakland or Western Pacific route.

Q.—Did you ever make any demand on the railroad company or it managers, to comply with the provisions of this Act with regard t passing prisoners and insane free over the entire route?

A.—I have of conductors, once or twice. I asked them if they woul take them free, and they said "No." I did so once or twice; twice mentioned it to them.

Q.—You never made application to the company?

A.—No, sir; I never did.

Mr. Burt—In passing prisoners over the road, did you make any de mand that they carry them from Auburn to Sacramento?

A.—Yes, sir; I showed them my commitments. That was satisfactory I told them they were insane, or convicts, and they always passed them free.

Q.—When you conveyed prisoners or insane persons, did you pa your own fare?

A.—Yes, sir.

Q.—Always?

A.—Yes, sir; I had a half-fare certificate up to January last. That was a matter for my own benefit.

Q.—In going with prisoners and insane persons, you considered that you paid your own fare?

A.—Yes, sir; I had a half fare certificate to Reno, ever since my election.

Mr. Coggins—Did they ever refuse to convey prisoners, or insane persons?

A.—No, sir.

Q.—Did you make a reduction in behalf of the State for that portion of the road between Auburn and Sacramento? Did you charge the State precisely the same as if you had to pay the fare for the prisoners and insane all the way?

A.—I never charged anything; I only got my mileage.

Q.—The State had the same to pay in settling with you as if they had not been carried free of charge from Auburn to Sacramento?

A.—No.

Q.—The State derived the benefit?

A.—Yes, sir; the State was called upon to pay only from Sacramento to San Quentin. In my claims I made a deduction for that portion of the road between Auburn and Sacramento, over which the prisoners and insane passed free.

Q.—They pay you mileage?

A.—Yes, sir; I got mileage from Auburn to San Quentin; the law allows that.

Mr. Coggins—It seems, then, that the State don't derive much benefit from the law.

Mr. Amerman—I understand that the law is, that Sheriffs, in transporting prisoners and insane persons, are allowed expenses.

A.—I never got a cent; I tried it this year, but never got anything. The Board of Examiners said that the mileage covered all expenses. That is the way they construe the law.

Q.—You never made any charge against the State for the actual expense in conveying prisoners and insane persons?

A.—I did a month or two ago.

Q.—Was it allowed?

A.—No, sir.

Mr. Coggins—So far as you are informed, are persons from Nevada and Sierra carried along the road free?

A.—I don't know; I can't say.

Mr. Howe—If you had to pay the fare of prisoners and insane persons from Auburn to Sacramento, you would not get any more yourself than you do now; you would get the same?

A.—The same.

Q.—Then the free passage is to the benefit of the Sheriff, and not of the State?

A.—Well, yes; I got mileage for through prisoners. I think the county has paid the expenses of insane persons. I think we have made that a county charge. I paid whatever expenses there were, and made it a county charge.

Mr. Amerman—Is that independent of the mileage you charged the State?

A.—I think so, to the asylum; for State Prison convicts, I have paid the expenses myself; that of insane patients, we have made a county charge.

Mr. Burt—The county has settled those bills up to within the last fe years?

A.—Yes, sir.

TESTIMONY OF J. H. NEFF.

J. H. Neff was sworn and examined:

Mr. Amerman—Mr. Neff, I believe you are one of the present Senato from Placer?

Answer—Yes, sir.

Question—You have been Sheriff of Placer County?

A.—Yes, sir.

Q.—How long?

A.—Two years.

Q.—What years?

A.—Eighteen hundred and sixty-eight to eighteen hundred an seventy.

Q.—During that time did you ever have occasion to convey prisone to San Quentin, or insane persons to Stockton?

A.—I did, sir.

Q.—What mode of conveyance did you transport them by?

A.—By rail.

Q.—With San Quentin prisoners?

A.—Yes, sir.

Q.—Did you come through to Oakland with San Quentin prisoners?

A.—I think not; perhaps, on one or two occasions I did, but I ha no distinct recollection of taking that route with prisoners.

Q.—During the time you were Sheriff, about how many prisoners di you convey to San Quentin?

A.—I can't tell, now; about twenty-three or twenty-four.

Q.—How many insane?

A.—About the same number.

Q.—In conveying persons to San Quentin and Stockton, by rail, di you pay the usual fare for yourself and prisoners?

A.—I did for myself, but not for prisoners; during a portion of m term I had a half-fare pass.

Q.—Did you pay anything for the conveyance of prisoners by rail?

A.—No, sir.

Q.—They were conveyed free?

A.—That's a fact.

Mr. Burt—In conveying prisoners or insane patients, did you inva ably pay your own fare?

A.—Yes, sir; I had a half-fare pass.

Q.—Did you ever make any demand on the railroad company to pa prisoners free?

A.—No, sir; they did it of their own accord; I would write the nam of the prisoner or insane person on a piece of paper and hand it to th conductor; that was sufficient.

Mr. Coggins—Did you get mileage from the State or county?

A.—For insane persons, from the county; for prisoners, from th State.

Q.—Did you ever make any deduction for that part of the road over which you traveled free?

A.—I followed the law.

Q.—Did you observe a different rule as to insane persons?

A.—No, sir.

Q.—In settling with the county, was any deduction made for the free portion of the road?

A.—There was not, sir.

Mr. Amerman—You considered that the Sheriff's perquisites?

A.—Yes, sir.

Mr. Howe—Did you carry insane persons from Sacramento to Stockton free?

A.—I think not.

Q.—Only from Auburn to Sacramento?

A.—Yes, sir; during a portion of my term I sometimes carried them by stage partly, and partly by steamboat.

Mr. Coggins—Did you make any demand to have the insane carried to Stockton free?

A.—I did not.

Mr. Amerman—Before you went out of office was the Central Pacific Railroad constructed between Stockton and Auburn?

A.—A portion of the road was not in running order; I don't think it was finished further than Galt; at least, not in running order.

Q.—The terminus was at Sacramento?

A.—Yes, sir.

TESTIMONY OF WILLIAM SEXTON.

William Sexton was sworn and examined:

Mr. Amerman—I believe you are an ex-Sheriff of Placer County?

Answer—Yes, sir.

Question—During what time?

A.—Eighteen hundred and sixty-four to eighteen hundred and sixty-six.

Q.—During the time you were Sheriff did you have occasion to convey prisoners to San Quentin and insane patients to Stockton?

A.—I did.

Q.—What route did you use?

A.—Part of the time by stage, part of the time by rail, part of the time by steamer. At first the road didn't run to Auburn.

Q.—During the time you were Sheriff, and conveyed those persons over the Central Pacific Railroad, where was the terminus of the railroad?

A.—At Sacramento.

Q.—Did you, or did you not, pay your own fare and that of the prisoners?

A.—I generally paid my own fare. There were six months I had a pass. Insane persons and prisoners were passed free.

Q.—Did you ever pay the fare of prisoners?

A.—I did not of State prisoners, and I did not of insane persons.

Q.—Was fare ever demanded by the railroad company, or thei officials, for prisoners or insane?

A.—No, sir; I showed the commitment, and they were passed free.

Mr. Howe—In settling with the State, did you make any deductio on account of the fare being free to prisoners?

A.—I did not; the State fixed the compensation for conveying prisoners; they provided in this bill, which fixed the mileage, that this road should carry free. I thought I was entitled to my mileage for the fu distance; I supposed they meant this when they made the law.

TESTIMONY OF MIKE BRYTE.

Mike Bryte was sworn and examined:

Mr. Amerman—I believe you were Sheriff of Sacramento County?

Answer—Yes, sir.

Question—How long?

A.—Two years.

Q.—Between what dates?

A.—Eighteen hundred and seventy-two and eighteen hundred and seventy-four.

Q.—During the time you were Sheriff, have you had occasion to convey prisoners to San Quentin, and insane persons to Stockton?

A.—I have.

Q.—By what routes did you convey these prisoners and insane persons?

A.—The prisoners by the Vallejo route, and the insane by the Wester Pacific road.

Q.—In conveying prisoners over the Vallejo route, did you pay the fare of these prisoners and yourself?

A.—I paid the fare of the prisoners; I had a free pass for myself.

Q.—In conveying insane persons by the Western Pacific, did you pay the fare of yourself and insane patients?

A.—I paid their fare; I had a pass for myself.

Q.—Did you ever make any demand of the railroad company for the fare of prisoners?

A.—No, sir.

Mr. Coggins—Did you for insane persons?

A.—I did not.

Q.—Never asked them to take them free of charge?

A.—No, sir.

TESTIMONY OF DRURY MELONE.

Drury Melone was sworn and examined:

Mr. Amerman—I believe you are Secretary of State?

Answer—Yes, sir.

Question—How long have you been such?

A.—Since December, eighteen hundred and seventy-one.

Q.—During the time you have been Secretary of State, have you any knowledge of the filing, in your office, of a contract, or agreement, signed by the President and Secretary of the Central Pacific Railroad Company, and sealed with their corporate seal, agreeing to comply with the conditions of a certain Act of eighteen hundred and sixty-four?

A.—There is such a document in my office.

Q.—Is that in your office now?

A.—It is, sir. It was filed May fifth, eighteen hundred and sixty-four—thirty-one days after the passage of the Act.

Q.—Have you any knowledge, derived from any papers filed in your office, as to the time when the Western and Central Pacific roads were consolidated?

A.—Yes, sir; January twenty-third, eighteen hundred and seventy-four. I can produce the articles of consolidation, if necessary; I have them in my hand.

TESTIMONY OF R. S. CAREY.

R. S. Carey was sworn and examined:

Mr. Amerman—You are President of the State Agricultural Society?

Answer—I am.

Question—How long since you became such?

A.—Since the twenty-fourth of January, eighteen hundred and seventy-three.

Q.—During the time you have been President, do you know of articles received for public exhibition over the railroad?

A.—Yes, sir.

Q.—Do you know whether those articles were forwarded from the place of shipment free of cost, or were charges made upon them?

A.—The rule has been —— I will state that I have been on the Board for eight years. The people pay the fare, when they come here, on stock, and all stuff that goes into the Pavilion. After they are shown, and the Fair is over, they come and bring the bill to the Secretary, at the Pavilion, or to the entry clerk, at the Park, and they give them a certificate that their articles had been exhibited, and attach them to the bills. They then go to the place where they started from, and get their money back on the up trip, by showing the certificate.

Q.—Then, this is how articles for exhibition are transported over the railroad free of cost?

A.—Yes, sir; our Secretary, Major Beck, can explain better than I can. They are forwarded free. We also get them over the Western Pacific and California Pacific. We have never been refused, to my knowledge.

Mr. Coggins—Has that been the rule since you were connected with the society?

A.—I think it has; we have never heard any complaint. We have shipped on the steamboats on the same terms.

TESTIMONY OF LELAND STANFORD.

Leland Stanford, sworn and examined:

Mr. Amerman—Governor, this committee is acting by virtue of th following preamble and resolution:

Whereas, By the provisions of an Act to aid the construction of th Central Pacific Railroad, and to secure the use of the same to this Sta for military and other purposes, and other matters relating thereto, ap proved April fourth, eighteen hundred and sixty-four, it is provid among other things, that the State of California shall guarantee an pay the interest upon certain bonds to be issued by the said Centr Pacific Railroad Company, upon the express condition that the said rai road company perform certain services for the State set forth in sai Act, and that the said railroad company, by deeds of conveyanc properly executed and acknowledged, shall convey to the State of Cal fornia certain lands in that Act described; and, whereas, it appears fro the reports of the Controller of State that the State of California ha paid the interest on said bonds issued by the said railroad company, in said Act provided, therefore be it

Resolved, That a special committee of five members of this House appointed by the Speaker, whose duty it shall be to investigate th matter, and ascertain whether the conditions imposed by said Act up the Central Pacific Railroad Company have been performed; that sai committee be empowered to send for persons and papers.

This resolution was adopted on the twenty-eighth of Februa eighteen hundred and seventy-four. Now you may state to the co mittee anything in relation thereto you can.

A.—So far as I know, we have always complied with the terms of th Act. That has been our intention, and I am not conscious that we ha ever failed.

Q.—One of the points we have been examining persons on has be with regard to the conveyance over the road of prisoners, insane p sons, and articles for the State Agricultural Society. What can you s on that point?

A.—So far as I have known, we have transported these articles fr When these go to the Agricultural Society, we cannot tell, beforeha where the people are going. We have no evidence except a man's sertion. So we collect as of others, and, upon proof that the goo have been exhibited, we return the money. We have construed th Act to apply to only that portion of the Central Pacific Railroad fr Sacramento to the State line. At the time that Act passed, the cor ration known as the Central Pacific Railroad Company was only fr Sacramento to the State line.

Mr. Burt—It seems that you have charged Sheriffs, and passed, fr prisoners and insane persons?

A.—Yes, sir.

Q.—The Act says that messengers of the State you are to pass fr

A.—Yes, sir.

Q.—Do you charge Sheriffs?

A.—Yes, sir. They are not State officers; they are county officers

Q.—In conveying prisoners to San Quentin, they are doing service for the State, are they not?

A.—I don't remember the law now, whether they are in the service of the State or county.

Q.—The State pays them?

A.—I don't know about that. We have not considered that they are State messengers; and, although we may have given passes to Sheriffs, we considered it right to charge, and would have done so, as far as that was concerned.

Q.—You never allowed one to pass over the road free, with regard to that law?

A.—No, sir; our counsel advised us that it was not the contract with the State. I am confident that the question was not raised by any of the State officers so that it came to my knowledge.

Mr. Amerman—Is it not usual for the Central Pacific Railroad Company to give passes, or half passes, to the Sheriffs of the several counties of the State?

A.—We have generally done so. We gave them half passes, or full passes, as they deserved them. In making arrests, they sometimes could do their official duties and perform various services for the company, which they would not do without passes.

Q.—There is also another subject of inquiry, with regard to deeds from this company; that is, the conveyance of a certain amount of land in Placer County. Have the company received a patent for that section?

A.—Not that I am aware of. One may have come lately, but I think not.

Q.—They never have made a deed of conveyance to the State?

A.—No, sir. We tried to get the title at one time. There was an affidavit filed that it was mineral land; and, by law, we don't receive mineral land. After a time, we were able to disprove that fact, but never received a patent. There were other claimants to it, and I think they obtained a patent for a portion of it. There is a portion of which the State has had the control. A portion of the granite in this building came from this portion of land, under contract with a man by the name of Smith.

Mr. Burt—Do you know if the company has made application for a patent for that section?

A.—I don't know; our land officers make those applications; I know there was an effort made to obtain a patent; we did what we could to get the title, but failed.

Mr. Amerman—Have the railroad company ever made any charge in the conveyance of material for the State Capitol building?

A.—No, sir; not with my knowledge was there ever a charge made; there was one other condition, that we should build twenty miles a year; that condition we have complied with.

Q.—[Reads.] "The company shall also construct and equip, in running order, at the rate of not less than twenty consecutive miles of their said railroad each year hereafter, including that portion of said railroad now partially completed, until the same is fully completed and equipped." Have the railroad company complied with this?

A.—They have.

Q.—About what time did the Central Pacific Railroad Company and the Western Pacific Railroad Company consolidate?

A.—I think, in eighteen hundred and seventy; in the early part of the year, I believe.

Q.—At the time this Act was passed, where was the terminus of th Central Pacific Railroad?

A.—At Sacramento.

Q.—At that time was it contemplated to extend the Central Pacif Railroad any further?

A.—No, sir.

Q.—This connection between San Francisco and Sacramento was no then in contemplation?

A.—No, sir; that portion of the road belonged to another compan independent of ours.

Mr. Coggins—At the time of the passage of this Act, did not the Cen tral Pacific Railroad Company own the franchise between here and Sa Francisco Bay?

A.—In eighteen hundred and sixty-four? No, sir; the original Ac of Congress—— Our company was organized to build a railroad fro the State line to New York. The original Act of Congress gave u power to commence from near San Francisco, or the navigable water of the Sacramento. We made a location at Sacramento City. Th Western Pacific Railroad Company was organized to run from San Jos to Sacramento.

Q.—At what date?

A.—I don't know what time; after the Western Pacific Railroad Com pany applied to Congress to get permission to build a road from Sacr mento to San José, we made them an assignment of any right we mig have; that assignment was confirmed by an Act of Congress. Th company commenced to build a road from San José to Niles, when changed hands, in part, and afterwards it was consolidated with th Central Pacific Railroad Company. This was in eighteen hundred an seventy, I think. That is about the history of it.

Q.—That covered the Government-derived franchise to land in virtu of the grant made to you?

A.—I think not. We have made an arrangement with the Secretar of the Interior which settles the matter.

Q.—Was not that assignment made subsequently to the passage this Act of April, eighteen hundred and sixty-four?

A.—No, sir; I think not.

Q.—Did you have the franchise at that time?

A.—We had no franchise.

Q.—The Act of Congress gives you land?

A.—Wherever we choose to locate.

Q.—You assigned the benefit to these parties?

A.—We gave them an assignment.

Q.—Is there a record in the Secretary of State's office of that assig ment?

A.—I don't think there was ever a record there. If it is an object can furnish the committee with the whole history of it.

Q.—Was the company, by the terms of this Act, bound as far Stockton?

A.—You can learn of this by the articles of incorporation, on file the office of the Secretary of State.

Q.—With regard to the granite quarries, do you know the name the person who has obtained the title to the tract?

A.—Mr. Hawes.

Q.—Is it not an odd section of land?

A.—Yes, sir.

Q.—Could he obtain a patent without the consent of the company?

A.—I think he has the title.

Q.—Did not the Act of Congress secure to the company every odd section of land not occupied?

A.—In this case, the gentleman claimed to have occupied it for five years before we went into operation.

Q.—What officers can give us information on this point?

A.—Mr. Redding, our agent, and Mr. Torbert, his assistant.

Q.—You say you can furnish us with the date of that assignment?

A.—I can, by sending to San Francisco.

Mr. Burt—Do you consider that the other man having obtained a patent for land in this tract, releases you from that portion of it?

A.—Yes, sir.

Q.—If some one else obtained a patent for the ground, you would not be obliged to comply with the terms of that contract?

A.—No; I think not.

Mr. Coggins—Do you know if the company made opposition to this man getting this quarry?

A.—I think our agent make such opposition as he could. I thought at the time Hawes had no valid claim. We had no knowledge of any adverse claim to that land.

Mr. Amerman—At the time of the passage of this Act, the terminus of the road was at Sacramento?

A.—Yes, sir.

Q.—The Central Pacific Railroad Company had no franchise, no right of way?

A.—Not unless by Act of Congress. We supposed when we made our location, and agreed to run a line to the State line, that settled the matter. We refused to convey to the Western Pacific Railroad Company until there was an Act of Congress to authorize it. I didn't consider we had the right.

Q.—Do you recollect about what time the Western Pacific Railroad was completed to Sacramento by way of Stockton?

A.—I don't remember; eighteen hundred and sixty-nine or eighteen hundred and seventy.

Q.—Between the passage of this Act of eighteen hundred and sixty-four and eighteen hundred and sixty-nine, there was no rail connection between Stockton and Sacramento under the control of the Central Pacific Railroad Company?

A.—No, sir; it was an independent organization until after it was completed.

Mr. Coggins—You considered you were not bound by this Act, so far as the Western Pacific Railroad was concerned?

A.—No, sir; we don't think there is anything in the law that requires it.

Mr. Burt—That is all one company now, is it?

A.—Yes, sir.

Q.—One road?

A.—One road; also a line running up the valley, known as the California and Oregon Railroad; also a line running up the San Joaquin Valley. We don't consider we are under any obligation to transport prisoners, insane, or State messengers over that portion of the road, free of charge.

Mr. Coggins—Can you tell what rights you assigned to the other company?

A.—Whatever rights we had.

Q.—Between here and San Francisco?

A.—Yes, sir.

Q.—If you had the right to build that road, are not the obligatio about the same on both roads in both directions?

A.—No, sir; if we could have built that portion of the road at an time, it would have been under an Act of Congress. Of course, by o articles we are confined, as far as the State laws are concerned; we a bound by the State laws; of the State, there was one giving us righ etc.; of Congress, one to extend our line.

Mr. Amerman—The original franchise of the Western Pacific Railroa Company was from San José to Sacramento?

A.—I think so.

Mr. Coggins—Can you tell, from memory, what year that assignme was made?

A.—No, sir, I can't do it.

TESTIMONY OF ELISHA HAWES.

Elisha Hawes was next sworn and examined:

Mr. Amerman—Mr. Hawes, you are a resident of Placer County?

Answer—I was.

Question—Where do you reside now?

A.—San Francisco.

Q.—Do you know anything about the south half of section ninete in township eleven north, of range seven east, in Placer County?

A.—I used to live there.

Q.—Is that the same land described in the Act of eighteen hund and sixty-four, in regard to the Central Pacific Railroad Company?

A.—Yes, sir.

Mr. Burt—Do you claim any portion of that, at present?

A.—Yes, sir.

Q.—What portion?

A.—The southwest quarter of section nineteen, range seven no of township eleven.

Q.—What title?

A.—United States patent.

Q.—How long have you had the patent?

A.—Since eighteen hundred and seventy-one.

Q.—How long have you claimed it?

A.—Since eighteen hundred and fifty-seven.

Q.—Have you ever had the title disputed?

A.—When I went to prove up my claim the railroad company obje to it.

Q.—What time was that?

A.—About a year before I got the patent; I can't say exactly; Land Office here can tell you what time I got it; the patent came f the agent at Washington; it didn't come through this office; my was clear; when the railroad company heard of it, they tried p hard to get it, but our title could not be broken.

Q.—How long have you held the land?

A.—Since eighteen hundred and fifty-seven.

Q.—About the year eighteen hundred and sixty-four, or previous to that time, did you know whether the railroad company was aware of your claiming the land?

A.—I don't know; I don't hardly think they did. I don't know what they knew, but I was there, on it. The location of the land was such, and the position of my house was such, that, without a survey being made, you would hardly think it was on the land.

Q.—How near the Town of Rocklin was the house?

A.—The Town of Rocklin is on the north half of section nineteen, and my house is on the south half.

Q.—I judge that the town lies on the south half.

A.—No, it lies on the north half; the most of the Town of Rocklin is on the northwest quarter and the northeast quarter, both.

Q.—You are positive of that, are you?

A.—Yes, sir.

Q.—Do you know how near the railroad runs to Rocklin?

A.—Near the line of the southwest quarter.

Q.—How near the town?

A.—The Town of Rocklin would be a little more than one half of the middle of the northwest quarter section. It did come down further; the houses were strung down the line of the road; some were burned down. They are now where the depot is. They moved there on account of the crowd going through.

Q.—Then the railroad runs through the south half of the section?

A.—It runs right through.

Q.—One half is thus occupied by Rocklin?

A.—Yes, sir; the town lies on the north half of the section.

Mr. Amerman—At the time of the passage of this Act of eighteen hundred and sixty-four, how long had you been in possession of that land?

A.—Since eighteen hundred and fifty-seven.

Q.—Since the passage of this Act, you have had no trouble with the railroad company?

A.—When we went to get the title they opposed it..

Q.—You say the Town of Rocklin is on the other half of that section?

A.—Yes, sir.

Q.—Do you know who owns the other half of this section?

A.—It is said to be railroad land.

Mr. Stanford—I don't think there has been any contest, except to its being mineral land.

Mr. Coggins—Does the land for which you have received a patent contain a granite quarry?

A.—Yes, sir.

Q.—How long since you were there?

A.—Eighteen hundred and fifty-seven.

Q.—You occupied it for farming purposes?

A.—Yes, sir.

Q.—Have you had a family there?

A.—Yes, sir.

Q.—Have you lived there continuously since that time?

A.—Yes, sir.

Q.—How much do you claim?

A.—One hundred and sixty acres.

Q.—How much contains granite deposit; how much of the one hu dred and sixty acres is covered with granite?

A.—About ten acres, on the surface.

Q.—Are there any more than that?

A.—No, sir.

Q.—That's rather a rough looking farm?

A.—Yes, sir.

Q.—Did you take it up with reference to the granite on it?

A.—No, sir; the valley is good land.

Mr. Stanford—It covers the land he owns; on the other quarter se tion there is granite.

Mr. Hawes—There is granite all through there; on each of the sections of land there are large deposits of granite.

Mr. Coggins—It would appear that there were large amounts of gra ite taken from there?

A.—Not from my place; some of the granite in this building ca from there, but not from my place.

Q.—Did you ever pay the railroad company for that land?

A.—No, sir.

Q.—Did you commence suit to maintain your rights when they sumed ownership of it?

A.—The United States Land Office is the only Court we go to. went to Marysville, and proved up, and there was mineral in all th section. I let the matter rest there. Finally the Land Office was moved to Sacramento, and when I was ready, I went down to it, a got witnesses to prove up my preëmption claim.

Q.—What steps did the railroad company take to prevent your g ting the claim?

A.—They came with a lawyer, and witnesses, and took testimo and examined witnesses, and the evidence went on to Washington.

Q.—Did you pay the Government any money?

A.—Yes, sir.

Q.—How much?

A.—One dollar and twenty-five cents per acre.

Q.—What is your business now?

A.—Granite and stone cutting.

Q.—How long?

A.—I have been quarrying since eighteen hundred and sixty-four.

Q.—Are you alone or in partnership?

A.—Partnership.

Q.—You say you are in partnership?

A.—Yes, sir.

Q.—Is any railroad man or employé interested with you?

A.—No, sir; nor never were.

Q.—Are not any of them interested in the quarrying business the

A.—I think not.

Q.—Is S. D. Smith interested with you?

A.—No, sir.

Q.—Is B. B. Redding interested with you?

A.—No, sir.

Mr. Stanford—If you ask me, I can tell you about that.

Q.—Well, you answer my question, with regard to Smith and Redd

A.—I don't know anything about their private affairs, but no rail man is interested in Hawes' quarry; I don't know about other quar

Mr. Burt—Do you consider this granite quarry on your land makes the land more valuable?

A.—If a man understood working it, and had business capacity, it would be more valuable because of the granite; but I don't know myself as it pays any better than farming.

TESTIMONY OF GEORGE H. McCALLUM.

George H. McCallum, sworn and examined:

Mr. Amerman—What is your business?

Answer—I have been clerk in the United States Land Office for five years.

Question—Have you any knowledge whether a patent has issued to the Central Pacific Railroad Company for a part of section nineteen?

A.—Not to the railroad company.

Q.—Has a patent been issued to any person?

A.—Not as the records of the office show. Sometimes a patent is issued to parties without coming through this office. They get their patents direct from Washington.

Q.—The records do not show that a patent has been issued to any person for any portion of the south half of the section?

A.—No, sir.

Q.—Do you know of the railroad company making application for a patent for that section?

A.—No, sir; not to my knowledge. The records of the office don't show it.

Q.—Would the records show it if it had been done?

A.—They should show it.

Q.—Do you know of anything to prevent their obtaining a patent if they made application?

A.—Not at this time.

Mr. Coggins—Do you know of a contest between the railroad company and any person?

A.—No further than the case of Hawes is concerned. He cited the railroad company to appear to prove the character of the country.

Q.—Did the railroad company respond and contest the case?

A.—I think the company appeared. It was customary for the company to appear by counsel to make inquiries. Hawes made payment for his land in eighteen hundred and sixty-nine.

Mr. Burt—Do you know anything about Mr. Hawes' filing?

A.—No, sir; it was before this office was removed from Marysville. The records show that it was made up at Washington.

Q.—You don't know whether his filing was previous to April, eighteen hundred and sixty-four, or not?

A.—No, I do not.

Q.—Will the records of the Land Office here show that fact?

A.—They will show that fact.

Mr. Coggins—At what date was this citation issued to the railroad company?

A.—I can't say. He made payment for the land on the twenty-nint of September, eighteen hundred and sixty-nine. I don't know whethe proof was made on this day or not. Usually, the company is give thirty days to appear.

Q.—It was prior to this date that the company was notified?

A.—Yes, sir.

Q.—Do you recollect the character of the contest?

A.—I do not. I don't recollect the case, more than a glance, in look ing at the section.

Mr. Amerman—Would the records of your office show, if a patent ha been issued to the railroad company, for any part of the south half o section nineteen?

A.—A list must be filed in this office; that is noted on the record The records do not show that any patent has been issued.

Q.—Then the records in your office do not show that a patent w issued to the railroad company for the south half of section nineteen?

A.—No, sir; there is no record of the fact.

Stanford to McCallum—Did you say that had been claimed as miner land?

A.—It was, by several affidavits by some thirty mineral claimants.

Q.—When was it proved up?

A.—May seventeenth, eighteen hundred and sixty-nine, the mine was proved up.

TESTIMONY OF JOHN L. LOVE.

John L. Love was sworn and examined:

Mr. Amerman—You are Attorney General of the State, I believe?

Answer—Yes, sir.

Question—A member of the State Board of Examiners?

A.—Yes, sir.

Q.—As a member of said Board, have you had occasion to pass up the claims of Sheriffs for conveying prisoners to San Quentin and ins patients to Stockton?

A.—Yes, sir.

Q.—In allowing claims, was any deduction made by the State Bo of Examiners, so far as free passage was concerned?

A.—Not that I know of.

Q.—You are familiar with the Act of eighteen hundred and sixty-fo

A.—Not particularly, sir.

Q.—Section four requires of the railroad company, in relation public messengers, that they be passed over the road free. What committee wants is, whether, in your opinion, Sheriffs convey prisoners to San Quentin are public messengers?

A.—I can't give an opinion upon the drop of the hat; I don't kn that I would swear to it after studying it some time.

Q.—I suppose it would be a mere matter of opinion, anyhow. S pose a case that a Sheriff should claim, in his capacity of Sheriff, c pensation for conveying prisoners to San Quentin, or insane person Stockton; suppose he should claim to be a public messenger, would consider this claim good?

A.—I should consider him a public messenger—though, as Chancelor Kent says, this is a mere "battery of opinion."

Governor Stanford to Love—With the consent of the committee, I would like to ask the General a question: How is it, General, if you consider those public messengers, within the meaning of that Act, that the Board of Examiners allow the accounts of the Sheriffs?

A.—I am not very familiar with this Act. No lawyer would undertake to give an opinion under such circumstances. I can't carry the statutes in my head.

Q.—Has not the Act been discussed in the Board of Examiners?

A.—Never. It never has been called to my attention.

Q.—Do you remember if the Board of Examiners have asked the railroad company to carry these messengers of the State free.

A.—Not to my knowledge; not since I have been a member of the Board. We have never had the question before the Board in any shape or manner.

TESTIMONY OF JOHN C. BURCH.

John C. Burch, sworn and examined:

Mr. Amerman—Have you ever had occasion to examine the Act of eighteen hundred and sixty-four?

Answer—My attention was called to it one time by Sheriff Woods, of Yuba County. He asked me the question which required my examination of the Act, in eighteen hundred and seventy-one.

Question—Was your attention directed to section four, in regard to conveying prisoners and insane persons?

A.—Sheriff Woods, of Yuba County, came to me to know if I had examined the Act, and to know if he could be required to pay passage for his prisoners or not. I looked at the law, and told him I thought they could not charge him from the Junction to Sacramento. He told me he had to pay for that portion of the road. That's all I know about it. So far as examining the question whether he was a public messenger or not, I can't say I did. I know nothing, personally, about prisoners being charged for transportation.

Mr. Coggins—Did you say he was compelled to pay?

A.—I understood him so.

Q.—That was in eighteen hundred and seventy-one, and several times since?

A.—Yes, sir; he saw me several times since, and told me the same. He came to my room and asked me to examine that law. I gave him my opinion that they could not charge him.

Governor Stanford to Mr. Burch—Did you understand him to say we charged him?

A.—Yes, sir.

Q.—Did you say he was refused?

A.—Yes, sir.

Q.—All prisoners and insane persons are to be passed free. These are the printed instructions to conductors. I have never heard they violated this rule. You say he was compelled to pay?

A.—I am confident he made the impression on my mind that he was compelled to pay. I told him he might get a free pass, but could not demand one for the whole distance. I told him he would not have to pay from the Junction to Sacramento. I told him where to find the law, and told him to show it to the conductors, and they would let him pass.

Q.—Did you understand him to say he called the attention of the principal office to it?

A.—Never. I understood him to say he told the conductors he paid on that portion of the road.

Q.—Have you not called the attention of the State officers to this law?

A.—I called the attention of the Governor to it. I did that some two years since. It was when I was at the Capitol on the Revision Committee. I think it was immediately after the adjournment of the last Legislature.

Governor Stanford—I want to say that no State officers have made complaints about the transportation of Sheriffs or prisoners. The printed instructions to conductors require them to pass these persons free. If this thing were investigated I think it would be discovered that they were passed free over the road.

Mr. Burch—I suggested to Mr. Woods to call the attention of the officers to this matter, and gave him the reference to the section where he could find the law.

The committee adjourned to Tuesday, March tenth, eighteen hundred and seventy-four.

TUESDAY, March 10th, 1874.

TESTIMONY OF MATTHEW WOODS.

MATTHEW WOODS was sworn and examined:

Mr. Amerman—You have been Sheriff of Yuba County?

Answer—I have.

Question—How long were you Sheriff?

A.—Four years.

Q.—During the time you were Sheriff of Yuba County you had occa sion to convey prisoners to San Quentin, and patients to the Insan Asylum?

A.—I have.

Q.—By what mode of conveyance were the prisoners taken to Sa Quentin?

A.—A portion of the time by way of the Vallejo route; as long that route was in operation I conveyed by that route. The patients Stockton I took by way of the Western Pacific Railroad.

Q.—In conveying prisoners or insane patients, did you take the over a portion of the Central Pacific Railroad?

A.—I did.

Q.—Between what points?

A.—Between Roseville, the junction, and Sacramento City.

Q.—In conveying those prisoners and insane patients by the Centr Pacific Railroad, did you pay your own fare and that of the prisone and patients between Roseville and Sacramento?

A.—I did.

Q.—Did you ever make any demand on the Central Pacific Railroad Company to have those persons carried free of charge?

A.—I don't think I ever did.

Q.—Were you aware, Mr. Woods, that the statute of eighteen hundred and sixty-four required them to convey prisoners and insane persons free of charge?

A.—I was.

Q.—You never made a demand on them?

A.—I never did, for this reason: to take a ticket from Marysville, the county seat of my county, to Roseville, and then take another ticket to Sacramento, and then another one there, I found I could not make anything by the operation; consequently, I never made the demand.

Q.—In presenting your claim for the conveyance of prisoners and insane, to the State Board of Examiners, you charged mileage for yourself and prisoners?

A.—I did.

Q.—Did any member of the Board of Examiners ever object to allow your claim, on the ground that you were a public messenger?

A.—Never did, sir. I will state here, that about the close of the last Legislature, I was presented with a pass from Governor Stanford, which was renewed from time to time, till the first of last January.

Q.—Was it during the two years you were Sheriff, you had a pass?

A.—Not quite two years.

Mr. Coggins—Did you ever make a demand to take insane persons over the Western Pacific Road free?

A.—No, sir.

Q.—Did you ever take legal counsel?

A.—I have counseled with persons with regard to it, but could never get any definite answer or advice.

Mr. Northcutt—You never made any demand for a pass for prisoners or patients?

A.—I never did, sir.

Q.—Then the pass Mr. Stanford gave you was for yourself?

A.—It was for myself.

Q.—If a demand had been made on Stanford for a pass, have you any reason to believe he would not have given it to you?

A.—I didn't think I was entitled to it, from the reading of the statute.

Mr. Burt—Did you not consider yourself a public messenger when transporting prisoners?

A.—I didn't so consider it. The short distance from Sacramento to Roseville I was entitled to, but I would not benefit by that.

Q.—In conveying prisoners, were you employed by the State, or were you by the county?

A.—By the State for convicts, and the county for insane.

Q.—In conveying prisoners you were employed by the State?

A.—I was.

Q.—Don't you think that would constitute you a State messenger?

A.—The Sheriff before me never made a demand, and I never did.

Q.—If you were employed by the State, would you not consider yourself a State messenger?

A.—I received my pay from the State.

Q.—You would consider yourself as working for the one who paid you, would you not?

A.—Yes, sir.

Mr. Amerman—You don't mean to say you were employed by th State to convey prisoners to San Quentin?

A.—The State paid me.

Q.—You received a commitment from the Courts in your county?

A.—Yes, sir.

Mr. Coggins—Do you know what has been the custom of Sheriffs in the counties north of you?

A.—I do not.

Mr. Northcutt—What is the mileage the State pays a Sheriff in going to the prison?

A.—Forty cents.

Q.—For all of the prisoners?

A.—Forty cents for the first, and twenty cents for each additional one.

Q.—You get no back mileage for them?

A.—No, sir.

TESTIMONY OF ROBERT BECK.

Robert Beck was sworn and examined:

Mr. Amerman—You are Secretary of the State Agricultural Society?

Answer—Yes, sir.

Question—How long have you occupied that position?

A.—For over five years.

Q.—During the time you have been Secretary of the State Agricultural Society, you have received articles for exhibition, at the differen Fairs of the society, by way of the Central Pacific Railroad?

A.—Yes, sir.

Q.—Do you or do you not know whether they required exhibitors t pay charges for transporting those articles to this place?

A.—The custom has been to charge freight on them to the State Fai and when they were taken back, with a certificate that they had bee exhibited, they got their money back.

Q.—Then, in reality, no charges are made?

A.—On nothing that comes simply for exhibition.

Mr. Burt—Where they were brought to the Fair, exhibited, and the sold, they received no money back?

A.—They paid their way up; when they were returned, they g their money back; when they were sold, they kept the money.

Q.—Do you know whether goods are generally returned or sold?

A.—A portion of them are returned, and a portion sold. A gentle man from San Francisco had a large lot of yeast powder—enough t half fill this room. This man sold, and did not get his money back. I know of other instances where they didn't get their money back.

Mr. Coggins—Has there been much trouble with exhibitors with r gard to returning money?

A.—There have been instances where men did not call for certificat or where they had lost them, and they would write to me, and I wou sent them a certificate.

Q.—In that case, could they collect the money?

A.—Always.

Q.—That has always been the rule?

A.—Always.

Q.—Has it applied to all roads controlled by this road?

A.—Yes, sir; on the Northern road, on the California Pacific, on the Western Pacific, and on steamers.

Mr. Amerman—Is it not true that a large part of the articles are sent here for the purpose of selling?

A.—To a large extent.

Mr. Coggins—Stock is frequently sold?

A.—Yes, sir; a large amount was sold; of late years, a large amount has been sold.

Mr. Amerman—Is it the practice with men who bring goods and stock to the Fair, to state to you that they want to sell?

A.—No, sir. For the past few years we have encouraged these auction sales, and notified persons who wanted to sell stock to inform me. In some cases, this has been done; but not generally.

TESTIMONY OF J. J. GREEN.

J. J. Green was sworn and examined:

Mr. Burt—You are the Controller of State?

Answer—Yes, sir.

Question—How long have you been so?

A.—Two years last December.

Q.—During the time you have held this position, have you ever known an instance where the State has derived any benefit from this law requiring the Central Pacific Railroad Company to convey prisoners over the road?

A.—I can't tell; there is no particular arrangement, that I know of; I can't tell unless I examine the books; I know that Sheriffs come in with claims of prisoners and insane persons; to get about the exact amount, I would have to look at my books.

Q.—Do you know of any instance where the State has derived any benefit by carrying prisoners and insane persons free over the road?

A.—I only know from vouchers with the Board of Examiners; I know nothing except what comes through the Board of Examiners.

Q.—What officers are considered public officers?

A.—Do you mean in any connection?

Q.—A Sheriff, his deputy, or anybody deputized by the Sheriff.

A.—The law says that public messengers are to be carried free over the road.

Q.—What constitutes a public messenger?

A.—That depends upon what his business is; if it is a Sheriff, Deputy Sheriff, or one traveling for the State, he is a public messenger.

Q.—Is not any one, who is doing State business, a public messenger?

A.—I think so.

Q.—Is not a County Treasurer, coming here to settle, a State messenger?

A.—A great many Treasurers I have never seen; they generally sent their returns through Wells, Fargo & Co.; I sent a circular to them to come here themselves; sometimes some are sick, and can't come, but a great many make settlements now, in person; there are some now who send in the old way.

Q.—Where they did come, would you regard them as public messengers?

A.—The State allows them so much for coming here; the State allows, I think, these officers some compensation; the State allows for the conveyance of criminals to the State Prison; it also allows for the conveyance of insane patients. The last Legislature passed an Act making this a State charge; before that time it was a county charge.

Q.—All of the State officers, where they have occasion to travel in the discharge of their official duties, you regard as public messengers, do you not?

A.—I don't know how you would designate them. There are a few State officers that travel in the interest of the State; the State Board of Equalization travels for the State; the Controller sometimes travels for the State; whether they would be classed as public messengers or not, I can't say.

Q.—The Sergeant-at-Arms of the Senate and Assembly travel for the State; would you regard those as public messengers?

A.—I would regard them as public messengers.

Q.—Where the State Board of Equalization and the Controller trave for the State, they receive mileage, do they not?

A.—Their expenses are all paid.

Q.—The same way with Sheriffs, who convey persons to San Quenti and patients to Stockton?

A.—Yes, sir.

Mr. Coggins—Did the State Board of Examiners ever make any demand for the free conveyance of prisoners and insane persons?

A.—I don't know.

Mr. Amerman—Did any member of the State Board of Equalizatio ever pay their fare?

A.—I can't say, only for myself; I always have.

TESTIMONY OF LELAND STANFORD—RECALLED.

Leland Stanford was recalled and examined:

Mr. Burt—Will you inform the committee what you regard as publi messengers?

Answer—I don't know as I can enumerate them now. Take th Sergeant-at-Arms of the Senate and Assembly, traveling on busine for the State, they would be public messengers; I suppose the ter messenger would depend on the nature of the business, and who p him.

Question—If he was employed by the State, and traveled on St business, how would you regard it?

A.—As a State messenger.

Q.—Are you aware that the Central Pacific Railroad Compa charges the Sergeant-at-Arms for passage?

A.—I don't know as it has.

Q.—Within a week past the Sergeant-at-Arms of the Assembly has made demand for free passage, and they refused him?

A.—Not to my knowledge. Do you know the name of the officer he made the demand upon?

Q.—I do not.

A.—On what road?

Q.—On this road; to travel from here to Roseville.

A.—I suppose he made application at the ticket office.

Q.—I don't know; I suppose so.

A.—If I had known it, I would have given him a pass; the ticket clerk didn't understand it, then.

Q.—He has had occasion to travel a good deal, and was charged every time.

A.—It is quite possible.

Q.—The law requires County Treasurers to come here to make settlement; the State requires it, and pays them; do you think they are public messengers, and entitled to free passage?

A.—If they were required in such a manner as that, it made a difference to the State whether they traveled or not; I suppose it would make a difference; whether they traveled and were paid or not, would make the difference.

Q.—Should it make a difference to the railroad company; if it is their duty to pass them, providing they do not get paid by the State a certain percentage, how can it make any difference to the railroad company how they are paid?

A.—I do not know what the law is in regard to it; if it appears that they are public messengers, I suppose they would be passed free.

Q.—It is the opinion of a majority of the committee that officers of that character, who travel in the service of the State, would be considered as public messengers; the object of my questions is to settle who are public messengers.

A.—The committee's opinion is entitled to credit; not knowing what the law is, I am not prepared to admit or deny; if it appeared that they were public messengers, the company would carry them between here and the State line.

Q.—You said, the other night, you didn't consider Sheriffs and insane patients as State persons?

A.—I do not.

Q.—You considered you could charge them?

A.—Yes, sir.

Q.—How would you treat prisoners and Sheriffs if they would not pay?

A.—We could refuse to carry them.

Q.—Could you do so?

A.—We could treat them the same as any one else; we could treat the Sheriff the same as any man traveling with his baggage.

Q.—The law requires you to carry them free?

A.—We would not do so.

Q.—With regard to the land at Rockland, can you tell us the situation of that land at present.

A.—I don't know as I can, definitely; I have thought a little more of that since last evening; there is an order of the Secretary of the Interior, reserving certain portions of land along the foothills as mineral land, until it was proven to the contrary; there was proof that th quarter section was mineral land; that was afterwards disproved; a subsequent order of the Secretary of the Interior put it in substantially th same shape again; that quarter of section, and a great many other sections of land, are tied up by this order; preëmptors now, to enter land have to disprove its mineral character; formerly, it was otherwise.

Q.—I am informed that other parties are engaged in quarrying granit Is that with the consent of the railroad company or not?

A.—Well, I think that the parties who are in possession quarrying, ha an arrangement with the State Capitol Commissioners to quarry and deliver granite for this building. They opened it at a great deal of expense, and then the State concluded not to use granite for the completio of the building, and they were heavy losers; and, I believe, they inten to put in a claim to the State for compensation; we have paid no attention to it.

Q.—I understand they claim to own the quarries?

A.—It may be possible; I have never heard such a claim advanced I will state, further, that whenever the mineral character of the landi disproved, we will have no trouble in getting a patent.

Q.—I understand from McCallum that the mineral was proved?

A.—Not since this order of the Secretary of the Interior.

Q.—It was not considered as mineral land?

A.—I don't consider it as such; there are large quantities of that lan along the foothills which is not mineral; but now the mineral charact has to be disproved.

Mr. Coggins—In the case of Sergeant-at-Arms traveling, what is th duty of agents when a demand is made to travel over any portion the road?

A.—To pass them.

Q.—Who should have been the person to apply to?

A.—The conductor could have passed them; the ticket agent has n power to grant a pass.

Q.—Have you printed rules which govern officers on that subject?

A.—Yes, sir; the general order is that all public messengers, trave ing on business of the State, are to be passed free.

Q.—Do you define, for their government, what are public messenger

A.—No, sir. We will now, probably, define them, since the questio is now raised; we have never had the question up before; we hav never had any trouble about public messengers before; they have a ways traveled over the road free.

Q.—In the matter of the assignment to the Western Pacific Railro Company. Have you learned the date of that assignment?

A.—I have a copy here. The date is the thirty-first day of Octob eighteen hundred and sixty-four. The Act of Congress confirming, w made March eighth, eighteen hundred and sixty-five.

Q.—You owned that franchise or right at the date of the passage this law?

A.—We did not consider we owned anything. After we had filed o maps with the Secretary of the Interior, we considered our wo finished, so far as that was concerned. The Western Pacific Railro Company applied to us for an assignment. We told them we did think we had the power. After a time, we consented to assign th our claim, with the understanding that they should get an Act of Co gress to get them to ratify this. They did not consider they had th claim till this was done. Congress authorized this.

Q.—Have you a copy of that assignment here?

A.—Yes, sir.

Q.—Any objections to reading it?

A.—No, sir; it reads as follows:

"This indenture, made this thirty-first day of October, eighteen hundred and sixty-four, between the Central Pacific Railroad Company of California, parties of the first part, and the Western Pacific Railroad Company, parties of the second part:

"The said Central Pacific Railroad Company of California, a corporation duly organized under the laws of the State of California, in consideration of the agreements and conditions herein contained, on the part of the said parties of the second part, and of the sum of one dollar to them in hand paid, the receipt of which is hereby acknowledged, do hereby assign, transfer, and quitclaim unto the said Western Pacific Railroad Company, a like corporation duly organized under the laws of said State, and to their successors and assigns, the right to construct, own, maintain, and operate all that portion of a line of railroad and telegraph lying between the City of Sacramento, through or near the City of Stockton, and a point on the San Francisco and San José Railroad, at or near the City of San José; there to connect with the line and track of the said San Francisco and San José Railroad, and connecting at the City of Sacramento with the line and track of the railroad of the said Central Pacific Railroad Company, so as to form a continuous line of railroad with said other railroads; hereby also assigning, transferring, and quitclaiming, as aforesaid, all the rights, privileges, and powers of constructing, owning, maintaining, and operating the said railroad and telegraph line between the points named and described as aforesaid, which the said the Central Pacific Railroad Company of California is or may be authorized to construct, own, maintain, and operate, by an Act of the Congress of the United States of America, entitled 'An Act to aid in the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean, and to secure to the Government the use of the same for postal, military, and other purposes,' approved July first, eighteen hundred and sixty-two, and the Act amendatory thereof, approved July second, eighteen hundred and sixty-four; hereby also assigning, transferring, and quitclaiming, as aforesaid, unto the Western Pacific Railroad Company, their successors and assigns, all the rights, grants, donations, rights of way, loan of the credit of the Government of the United States, or the bonds thereof, and every other right and thing, so far as concerns or relates to that portion of the said railroad and telegraph line hereinbefore described and designated, the right to construct, own, maintain, and operate which is hereby assigned, to which the said Central Pacific Railroad Company of California is or would be entitled under the Acts of Congress aforesaid, if this assignment had not been made; hereby also assigning, transferring, and quitclaiming, as aforesaid, unto the said the Western Pacific Railroad Company, their successors and assigns, all right to the railroad line or route heretofore established, located, and fixed by the said the Central Pacific Railroad Company of California, between the said City of Sacramento and said point on the San Francisco and San José Railroad, at or near the City of San José, as hereinbefore described, forming the connections as aforesaid; hereby fully vesting in the said the Western Pacific Railroad Company, their successors and assigns, all the rights, privileges, and powers in and to the line or route so established, fixed, and located, as aforesaid, between the points aforesaid, forming the connections terminating as aforesaid, to which the said the Central Pacific Rail Company of California is or would be entitled under the Acts of gress aforesaid, if this assignment had not been made.

"The foregoing assignment is made upon the following express te stipulations, provisions, and conditions, to be done, observed, and p formed by the said Western Pacific Railroad Company, their succes and assigns, and all persons claiming any right, title, or interest in matters herein assigned, by, through, or under the said Western Pa Railroad Company, to wit: the said the Western Pacific Railr Company shall and will, at any and all times hereafter, well, truly, faithfully do, observe, comply with, and perform all, each, and ev act, requirement, term, stipulation, proviso, and condition of all the A of Congress now in force, or which may hereafter be enacted, so far concerns or relates to or affects that portion of the said railroad telegraph line hereby assigned, and shall and will save harmless keep indemnified the said the Central Pacific Railroad Company California, their successors and assigns, and their railroad and t graph line lying eastwardly of the City of Sacramento, of and from damages, suits, actions, costs, charges, expenses, and liability of ev kind and nature whatsoever, by reason of this assignment, or grow out of or relating to the said portion of the said railroad and telegr line herein and hereby assigned, or growing out of or relating to constructing, running, maintaining, or operating the said portion of railroad and telegraph line herein and hereby assigned. Also, that the Western Pacific Railroad Company, their successors and assig and all persons claiming by, through, or under them, shall and will struct and complete the said portion of said railroad and telegraph herein and hereby conveyed, at the rate of not less than twenty miles each year, from and after the first day of December, eighteen dred and sixty-four; but the whole of said railroad and telegraph shall be completed in four years from said date, or within such furt time as may be allowed by Congress, and that they shall and will loc and construct that portion of said railroad and telegraph line herein hereby assigned, lying within five miles of the City of Sacramento, as not to vary from a direct air line from the said City of Sacram to the City of Stockton; and the remainder of said line between point and the City of Stockton shall be so located and constructed the same shall not vary more than five miles on either side of a di air line between said point and a point at or near the City of Stockt nor shall the said Western Pacific Railroad Company, their succes or assigns, construct any branch railroad from, or connecting with portion of their said railroad line between the Cities of Sacram and Stockton, without the written permission and consent of the Central Pacific Railroad Company of California being first had and tained; and the said line and track of said railroad shall be so loc and constructed as to connect with the line and track of the said tral Pacific Railroad Company in the City of Sacramento, and with line and track of the San Francisco and San José Railroad at or the City of San José, so that, when completed, the same shall, with said other railroads, form a continuous line of railroad and telegr from the City of San Francisco, through the Counties of San Franc San Mateo, Santa Clara, Alameda, San Joaquin, Sacramento, Placer, Nevada, and through or near the Cities of Sacramento and Stockton, the eastern boundary line of the State of California. And it is furt

agreed and conditioned that the said Western Pacific Railroad Company, or their successors, shall not assign, transfer, or convey any of the rights, privileges, donations, grants, and franchises herein and hereby assigned, or any part thereof, to any person or corporation, without the written consent of the said Central Pacific Railroad Company of California, their successors or assigns, being first had and obtained; and any and all persons or corporations claiming or holding any right, title, or interest in the matters or things herein and hereby assigned, by assignment or otherwise, shall be bound and liable to do, observe, and perform all and each of the terms, stipulations, provisions, and conditions of this instrument, the same as though such person or corporation were mentioned in this instrument, and they had executed the same; and a failure, neglect, or refusal on the part of said parties of the second part, their successors or assigns, to well, truly, and faithfully, substantially and in good faith do, observe, and perform the terms, stipulations, provisions, or conditions of this instrument, or of the said Acts of Congress relating to said portion of said railroad and telegraph line, shall make and render the foregoing assignment, transfer, and conveyance null and void, and of no effect; and all the rights, privileges, grants, donations, and franchises herein and hereby assigned, and all the unsold public lands, and unsold Government bonds or obligations, which shall or may have been received by the said Western Pacific Railroad Company, their successors and assigns, and all of said railroad and telegraph line herein and hereby assigned, constructed, unconstructed, or only partially completed, and all the rolling stock thereof, shall thereupon immediately revert and belong to and vest in the said the Central Pacific Railroad Company of California, their successors and assigns, who shall have the right thereupon to enter upon and take full and complete possession as the owner thereof; and the said the Western Pacific Railroad Company, their successors and assigns, shall thereupon execute, acknowledge, and deliver all instruments necessary or proper to assign, transfer, and convey, and vest the same in the said the Central Pacific Railroad Company of California, their successors and assigns; and to secure the due and faithful performance and observance of the terms, provisions, and conditions of this instrument, the said Western Pacific Railroad Company hereby pledge to the said Central Pacific Railroad Company of California, their successors and assigns, their said railroad and telegraph line, and all other property, real and personal, now, or which may at any time hereafter, be held or owned by them.

"In testimony whereof, we, Leland Stanford, President, and E. H. Miller, Jr., Secretary of the said Central Pacific Railroad Company of California, have, under and in obedience to an order of the Board of Directors of said company, hereunto set our hands, and affixed the corporate seal of said company; and we, Timothy Dame, President, and Charles W. Sanger, Secretary of the said Western Pacific Railroad Company, have, under and in obedience to an order of the Board of

Directors of the said company, hereunto set our hands, and affixed corporate seal of the said company, the day and year aforesaid.

[Seal C. P. R. R. Co.]

(Signed:) "LELAND STANFORD,
"President C. P. R. R. Co. of Cal
(Signed:) "E. H. MILLER, Jr.,
"Secretary C. P. R. R. Co
Attest: "E. B. CROCKER,
(Signed:) "TIMOTHY DAME,
"President W. P. R. R. Co
(Signed:) "CHARLES W. SANGER,
"Secretary W. P. R. R. Co."

[U. S. Internal Revenue stamps, $192 50; canceled.]

[Duly acknowledged.]

Q.—You purchased that right in eighteen hundred and sixty-ni was it not?

A.—No, sir; the Western Pacific Railroad Company was always i pendent of the Central Pacific when that consolidation took place; was not one company; it was organized earlier; it was organized eighteen hundred and sixty-two, in December.

Q.—Was the Western Pacific organized in eighteen hundred a sixty-two?

A.—Yes, sir; we have the articles of incorporation here; it w entirely independent of the Central Pacific at the time of the Act the Legislature.

Mr. Amerman—In relation to public messengers, are your tic agents along the places on the road authorized to issue passes, or g an applicant a free ticket?

A.—No, sir.

Q.—Application of men claiming to be public messengers should made to the conductor?

A.—Yes, sir; I think it would be well to have a full list of pu officers, or those claiming to be such. A person who travels as a pu messenger may not have his authority with him. If the State wo supply us with a list we could know these men.

Q.—Would you not require men to show that they were public m sengers?

A.—From some source; some evidence. Of course, if we had p sonal knowledge that a man was a public messenger, we would be sa fied.

Q.—The same way with prisoners and insane?

A.—Yes, sir; our conductors are not permitted to pass any perso unless they show evidence.

Q.—Has the railroad company ever given any person permission work those quarries on that quarter section?

A.—Yes, sir; they must have done so. The parties had contra with the State to quarry granite there. No other party was, as far I know of. There is considerable granite quarried there for the Sta and for the railroad company.

Q.—Is it true that the Central Pacific Railroad Company is not str ing to obtain the patent for that land?

A.—That is not true, sir.

Q.—There is a rumor that the railroad company are not making any endeavor to get this patent.

A.—That is in our Land Department, sir; I presume that when we get allowed to disprove the character of the land, we will do so.

Q.—There is no doubt but what the State has a right to use that?

A.—No, sir.

Q.—There is a rumor that the railroad company is not trying to get the land so as not to deed it to the State?

A.—It is not true, sir.

Mr. Coggins—Has the State used any granite from that section in the construction of this building?

A.—Not that I am aware of.

Q.—Has the State tried to prevent these parties from quarrying granite on that section?

A.—Not that I am aware of.

Q.—Has the railroad company the right to prevent these parties from quarrying them?

A.—I think that is a legal question.

Q.—I suppose the State could not control it?

A.—I suppose the State would not find any difficulty in using it.

Q.—If others would take stone from there, is it not diminishing the value of the land?

A.—There is granite there in any quantity.

Q.—Do you say the railroad company has the power to stop them from working?

A.—No, sir; I don't say that; that is a mooted question. We attempted to assert that right some time since, and to prevent waste on sections that would ultimately come to the railroad company. But the people have always found lawyers that advised them that we could not do it.

Mr. Burt—At the time this contract was made, was the railroad company aware that there was a preëmption claim for a part of that half section?

A.—No, sir.

Q.—It seems from the records of the Land Office, that a preëmption claim was filed in eighteen hundred and fifty-seven.

A.—I remember when Mr. Hawes first asserted that claim. A brush fence appeared, and I did not think there was much real occupation there. He had a line of fence along the line of the road, but he had a house you could not see from the line of the road, and it turned out afterward that he had occupied it. That's the way that quarter section was settled. We can give the State the title when we get it. We are anxious to give the State the title to it, so as to have a branch prison there. We thought it would be to our benefit, and to that of the State, to have the branch prison located there, so as to make use of that quarry. The quarter section which Mr. Hawes has is not so good a quarry as that quarter section we consider that the State will get.

Q.—There is very little granite, then, on the quarter section he claims?

A.—Very little; and the quality is not good. The surface don't seem to be so good as the other. I don't want to say anything disparaging to his granite, but such is the fact. I want to say this: that the railroad company has always intended to carry all public messengers, if they give us some evidence. If this is done, there will never be any dispute between the railroad company and the State. Except what I have learned here, I have never heard anything about the rights persons to travel as messengers. We will consider that when requi We will not be technical about them. We want to know who sh make the demand on us.

Mr. Burt—You will take him, when you know he has a right to trav

A.—Yes, sir; when we are assured that he is a public messenger will let him travel free. Where a person wants to travel free, he mu show some evidence to the conductor. The conductor has no right let a person travel free, unless that person shows some evidence.

Mr. Northcutt—The conductor would not be likely to pass the Se geant-at-Arms over the road unless he knew of the law, would he?

A.—I understand that all public messengers shall be passed free.

Q.—That is the rule of the road?

A.—That is a printed rule; but he will require the Sergeant-of-Ar to give his authority.

Q.—The Sheriff, to travel, has to show who he is, I suppose?

A.—I suppose the conductor must be satisfied.

Stanford to Burt—Mr. Chairman, let me ask you a question: Wh are your ideas as to public messengers, how they are defined, and wh they are, in regard to this Act?

A.—Any person employed by the State, and paid by the State, w has occasion to travel in the discharge of that duty, becomes a pub messenger.

Q.—In the absence of any law on the subject, it throws the burd on the conductor to tell who is a public messenger?

A.—Then he should have some authority with him.

Q.—I will say that if a messenger travels for the State, it will be sa to say that he should travel free. As to a County Treasurer, I do think he is a public messenger within the meaning of the Act. Th may be an open question, though it suggests the difficulty, in the a sence of a definition as to what are public messengers. There ha been so few cases of that kind, since public messengers have alwa traveled free, that the want of a definition has not heretofore been fe It will be of consequence in future, since we have made a different ru Conductors should know what are public messengers.

Burt to Stanford—With regard to the County Treasurers, what shou be the duty of the Board of Examiners, where they are conveyed ov the road free?

A.—We can see the difficulty. They don't seem to be able to t who are public messengers.

Q.—The matter has never been canvassed in the Board?

A.—Burch said he called the attention of the Governor two years a to it.

Q.—It was not contemplated, when the Act was passed, that Sheri were officers of that character. The question, as I consider it, is, w would derive the benefit of the law?

A.—I never heard the question raised, that Sheriffs should ride fr till I heard it here in the committee. The law passes prisoners free.

Q.—Yes, sir; at the same time, the Sheriffs get mileage for taki them. Now, suppose that he passes free, would there be any less mi age due him from the State?

A.—Not unless the State Board of Examiners took that into cons eration, and took that amount from what was due him.

Q.—It may be that the law is that they are entitled to mileage, a the State Board of Examiners may have no power to make any ded

tion. You see how difficult it is for a conductor, who has never seen the law, to determine these things.

Mr. Coggins—The chief difficulty seems to be, that the State has not determined what is a public messenger?

A.—I can't say how far the State can do this, since they may say a private person is a public messenger. The State can't declare every man a public messenger.

Q.—I may say that Sheriffs, etc., are public messengers?

A.—It must be a question of fact whether they are public messengers or not. It is very easy for some competent Board to give us a list of what are considered as public messengers, which would aid us. I shall now have our counsel examine carefully and make out a list of what they consider public messengers, to apply to and govern conductors and other officers.

Mr. Amerman—I am free to state that I can't exactly define the term "public messenger," myself. My notion is that it would include all parties that are in business for the State; it may go further, and include Sheriffs, County Treasurers, etc., but the rest of the committee and I can't agree as to that.

A.—I never supposed there was any difficulty. I see now that there is a difficulty to determine who they are.

Stanford to Burt—Does the Sergeant-at-Arms receive mileage?

A.—He does.

Q.—Would the State be benefited by passing him free?

A.—It could be done by making a reduction.

Q.—Can this be done with the law as it now stands?

A.—I think the Board of Examiners can do it.

Mr. Burt—The object of this inquiry was this: I was satisfied that the State was deriving no benefit from this Act, though I did not know whose fault it was.

A.—I understand that, and it seems proper. I am glad that the committee inquires into this, to see if there was any desire or effort on the art of the railroad company to avoid its fair obligations. Perhaps out f this inquiry some means can be arrived at to see who are public messengers. As it—the law—now stands, whether they are carried free or ot, I can't see that the State would derive any benefit.

Q.—That is the question between the State and railroad company.

A.—I shall cause our counsel to determine what are messengers, and hall cause a list of these messengers to be furnished to our conductors.

Q.—Can you arrange it so as to give us a list within a few days?

A.—I don't know but I can. It will take some time. I will have to ok into the matter, to see how many of the officers can travel on the art of the State. I shall have to make an inquiry, to ascertain how heriffs, etc., are paid.

Q.—I think that there is no question but that Sheriffs and Treasurers e paid by the State.

A.—I think that it will turn out in future that somebody will be left t who may be a messenger.

Q.—That can be corrected from time to time.

Mr. Coggins—You are positive, after deliberation, that the Western cific Railroad Company is not bound by the Act of eighteen hundred d sixty-four, between here and Stockton?

A.—Yes, sir; we have been advised so by our counsel.

Mr. Amerman—If it is not too much trouble for the company, I thin it would be well if the company would define what is a public messenge so that in making up our report, we can report that to the House.

A.—I will instruct our counsel to do this.

Q.—Of course, the railroad company are willing to carry public me sengers in accordance with the terms of this Act?

A.—When this bill becomes a law, we will be very careful not to pa people free, unless they are entitled to it. Of course, I suppose publ messengers would go free.

TESTIMONY OF GEORGE McCALLUM—RECALLED.

George McCallum was recalled:

Mr. Burt—Can you inform the committee as to the date Mr. Haw filed on the southwest quarter of section nineteen?

Answer—Yes, sir; he filed on that land April eighteenth, eighte hundred and fifty-seven.

Question—That is regarded as public notice to the world, is it not?

A.—Yes, sir; as to that quarter section.

Q.—Did I understand you to say, the other evening, that that half tion had been proven to be non-mineral land?

A.—I said so. It has since been considered to be mineral, by a let from the Department, in eighteen hundred and seventy-one; sub quently, we received another letter that restored it as agricultural la which was noted on the books, as to this township. I made an exami tion to-day, and saw that this had been neglected, for some reason other. Under this last letter, this section is not mineral, but agri tural.

Mr. Stanford to Mr. McCallum—That information is good.

A.—We received a letter from the Secretary of the Interior, dir ing us to treat this as non-mineral.

Q.—Do you remember the time when they mailed this last letter the Commissioner of the General Land Office?

A.—I don't recollect the date of that letter; I believe it was in teen hundred and seventy-two—in the early part of eighteen hund and seventy-two, I think.

Mr. Burt—There is nothing to prevent the railroad company getting a patent to the land now, is there?

A.—Not as shown on the records of the Land Office.

Mr. Coggins—Up to last night, it was a question of doubt as to ruling of the Department as to this land?

A.—Yes, sir; all the land in that county; this letter of Dece second, eighteen hundred and seventy-one, directs us to treat it as eral; it has never been determined by this office how to act under circumstances.

Q.—Are you aware that the railroad company has tried to obt reversal of that ruling?

A.—I don't know that they have.

Q.—I will state to the committee that we have. Our agents at ington have endeavored to obtain a reversal of this decision. It

not just to the railroad company, nor to persons who wanted to preëmpt land, to be compelled to disprove its mineral character.

McCallum—I will state that section thirty, south of this preëmption claim, is now on trial in the office, as to the character of the land. It has been postponed from time to time, but is going on now. This adjoins that same portion of that township where section nineteen is situated.

Mr. Amerman—You say that as far as that township is concerned, it is settled whether the whole or a portion of that township is mineral land or not?

A.—We cannot determine for ourselves. It has never been determined by the Department at Washington how to treat this ruling.

Mr. Burt—You say you had been directed to consider section nineteen as mineral land?

A.—Yes, sir.

Stanford to McCallum—Do you know whether we have applied for that land?

A.—The records don't show it.

Q.—Would they show it?

A.—They should show it. Applications are presented to the Register and Receiver; they transmit them to the General Land Office. The records should show all these records.

Q.—When was this office started?

A.—November fourth, eighteen hundred and sixty-seven.

Q.—It seems to me that we made application for that land earlier than this; but our Land Office can show this fact.

A.—We have nothing there in our office which shows that any application was ever made on behalf of the railroad company.

Q.—According to my recollection, we made application to have that land listed.

A.—That may have been in the Marysville office.

Q.—There was some evidence that the whole of that section was mineral. They got affidavits showing that the land was mineral land; but there had never been any mining on it. There is a good deal of land there that we could sell if we could get the title that we are entitled to.

TESTIMONY OF EDGAR MILLS.

Edgar Mills was sworn and examined:

Mr. Burt—Mr. Mills, you are acquainted with the half section of land at Rocklin that the railroad company proposes to deed to the State?

Answer—Yes, sir.

Question—Do you know anything about the granite quarries on that section?

A.—Yes, sir.

Q.—Can you tell us the situation they are now in?

A.—Do you want a whole history of the thing, or ——

Q.—Yes, tell us all you know about it.

A.—This part of my statement I make from information. I know nothing of my own knowledge. But my information is such that I know it to be true. The Central Pacific Railroad Company, in consideration of the State guaranteeing the payment of one million five hundred thousand dollars, agreed, as one of the conditions of the grant, that they would deed to the State, when they got the title, the half section of land containing this granite, for the purpose of building the Capitol, and bring it here free of charge. I understand that to half of that section, or a quarter section, title has been gained by parties in Placer, who are in possession, and have a kind of possession of the balance of it. They have no title. Mr. S. D. Smith, the contractor that furnished stone for the Capitol, was authorized by the Board of Capitol Commissioners to furnish stone for this building, and to go on and open the quarry. Then it was no quarry there at all. He started to work and opened this quarry, and furnished stone for the Capitol, and opened it at great expense. My knowledge of the matter comes in this way; Smith was to furnish the stone; I furnished him money to open the quarry. Other parties furnished him with means to buy machinery and tools. He opened the quarry under the contract and furnished stone, which is very good indeed. He furnished stone only for a portion of this basement story, the stone of which is very heavy and very expensive, particularly as payment was for the superficial foot. He furnished that stone until there got to be a difficulty between the stonecutters and the State. The Board of State Capitol Commissioners, of which I was a member at that time, decided to abandon stone, as they could not complete the building in the time they wished to, with stone, and it was an enormous expense. They decided to abandon stone and complete the building with brick and iron, which they did, and Smith was not compensated, nor were his creditors. He failed, and his creditors hold possession of the quarry. That is the condition of the affair. Mr. Smith has a claim against this State, as valid a one as was ever before this or any other Legislature, as damages for the State not taking the stone. He is bankrupt, and his creditors have lost money. He applied to the last Legislature, but there was a rule that no claim should be allowed until it should be passed upon and allowed by the Board of Examiners. There is a bill now in the Senate in which these facts are stated. It has been before the committee, but they don't recommend it. I ask you, gentlemen, to report on this. We ask for some consideration. We have opened the quarry at great expense, while the State has been saved a great many hundreds of thousands of dollars. I ask this committee to examine into and report upon it. The minutes of the Capitol Commissioners show that the claim was filed with them, but they shirked the matter and threw it to their successors. The quarry is now held by Smith, or rather by his assigns, as security for debts. I am one of his assignees.

Q.—Do you claim to have a title to this quarry?

A.—We hold under the State as contractor with the State Capitol Commissioners; the contract stated that if the stone was abandoned by the Capitol Commissioners, Smith should have possession of the quarry until such time as he should get sufficient stone out to compensate him for the trouble and expense of opening it; Reuben Clark, the then architect, was to decide when this amount had been taken; he has since died; the creditors of Smith, of which I am one, allowed persons to take stone from there; you see that we have furnished all the stone for the Capitol which was required, and have complied with the contract, in regard to prices; we now hold the quarry under the State, in hopes to get something back for opening it; we ask the State, and it would be little loss to them, and we ask your committee, to award to us the balance there is there, and we will accept this as a full settlement of our claims.

Mr. Northcutt—What estimated value do you put on the quarry?

A.—I don't know the value of it.

Mr. Coggins—What is the amount of that claim?

A.—My claim is twenty thousand dollars; the claims of merchants here would make the total about thirty-five thousand dollars.

Mr. Burt—You would take the quarry for that claim?

A.—Yes, sir.

Mr. Coggins—Do you speak for all the creditors?

A.—Yes, sir.

Q.—What is the quarry worth?

A.—That I can't tell; we have machinery on it, which belongs to us, derricks, etc., and tools; all of which we furnish to persons who want to take stone out, and charge them only fifty cents a ton for it; they use all the machinery, and pay fifty cents per ton. It is very expensive to carry the granite to San Francisco, as that is the only market there is for it; there is great competition, prices are low, and it requires a business man to run it, so as to make anything out of it; we lease it at fifty cents.

Mr. Burt—What is the condition of that lease?

A.—Since we hold possession, he leases of us.

Q.—What is the name of the man?

A.—I do not know; I was in Europe at the time; it was made by Huntington, Hopkins, and Mr. Gallatin, in my absence; they made the lease subject to our possession of the quarry.

Mr. Northcutt—This man's name is Smith, that has the patent?

A.—No, sir; nobody has a patent. The railroad company will deed the land to the State when they get a patent.

Mr. Coggins—That is, a quarter section only?

A.—They will deed the land when they get half a section; they are to deed it when they get the title; they don't profess to deed it until they do get a good title to the land.

Q.—Do you hold both quarter sections?

A.—No, sir; we lease only a small hole on this quarry; it is very close to one corner of it. The balance of the land is of no value—it is of no value, except what has been made by the unfortunate people who furnished money to open it.

Mr. Burt—Now, the claims which you have would not prevent the railroad company's giving the State a valid title when they got it?

A.—No, sir; of course, we cannot have any claim against the State, unless they see fit to allow it. This claim of ours is only an equitable one, but is as just a one as was ever presented to the State. They broke heir contract, and we suffered. Another contractor was awarded twenty-five thousand dollars. I can procure you a copy of a claim alowed during Governor Haight's term, for twenty-five thousand dollars, where they only commenced to open their quarries.

Mr. Burt—You say you were one of the Capitol Commissioners, at the me the stone was abandoned?

A.—Yes, sir.

Q.—Did you get any portion of the stone from Folsom?

A.—That was before I was Commissioner. Some did come after I was ppointed; I was appointed to succeed Judge Munson. When the State tered into contract with Smith, they abandoned Folsom stone, because was so hard, and was more expensive. They got stone from Rocklin.

sixty-eight cents per foot. It was a ruinous contract. The low parts of the building would have to be solid stone; the other parts the building—the stairs, these upper walls, the porticoes, etc.—woul have secured to the contractor a large profit; what expense he woul have incurred on the lower story he could have made up on the uppe portions. The stone for finishing this story (the third) would hav been thin, and backed up with brick. There would have been a larg profit in this, as the contractor would be allowed pay for the superficia foot. Money would be lost on the first story, and gained on the res The stone was abandoned before the paying work began, and cons quently, failure resulted. Mr. Smith made no money out of it, but wa bankrupted, and he now looks to you for compensation. We are no left in possession of the place to pay for our debts.

Mr. Coggins—What is the date of Smith's assignment to you—the as signment under which you took possession?

A.—I cannot say; it has been for several years. There has been stone taken out for the Capitol, only for the last few months.

Q.—What time did you lease it?

A.—Last year.

Q.—And for an indefinite length of time?

A.—One or two years; I don't know; I never saw the lease.

Q.—Is it leased to an individual or to a firm?

A.—I think to an individual.

Q.—Is Hawes one?

A.—I don't know.

Q.—Is one named Brown?

A.—I do not know, but I think it is; I never saw the contract. M Gallatin made the arrangement. I ask the committee to report to th House a deed for that quarter section to S. D. Smith, or his assigns, recommend that such a deed be made. It is of very little value to th State.

Mr. Burt—That is going outside of this committee's powers.

Mr. Mills—I ask the committee to do this in behalf of those pers who have been injured by the State.

Mr. Coggins—You speak of your claim as being twenty thous dollars; that has been reduced, has it not, by the stone taken out?

A.—Not at all. Mr. Gallatin may have some money; but he never paid anything to us. Our original claim is fifteen thousand lars, for which we have a mortgage; but, of course, we have no ti this mortgage is no good as against the State.

Q.—You say you have a copy of the contract with Smith?

A.—Yes, sir; Mr. Crane can give you a copy at a moment's notice; has been before the committee in the Senate. They didn't consider favorably. I never was more surprised, and did not intend to press matter further in asking the Legislature to pass a bill for the relief this man. It is a just claim for real damages. Mr. Cummings will that the State has been saved hundreds of thousands of dollars by abandonment of stone. It was saved by making the change from st to brick. Stonecutters charged eight dollars per day, and worked w they pleased. The State has saved, on an estimate, three hund thousand dollars by running up these walls with brick. It was not than a million. The management of this building, and the build itself, is a credit to the State, and the people may consider it ch considering the administration during which the foundations w built. It is cheaper than any building in this State; it is a better bu

ing, and the State can afford to reimburse these parties for what they have suffered. There is better brick in this than in any other State building. The contractors furnished brick of the finest quality for seven dollars per thousand, and failed. They were all reimbursed. Bowers and somebody else were the contractors. Smith failed, and we want the State Legislature to give us relief. I don't think anybody knows anything more about this than Smith and I do. I have been familiar with the matter, as Capitol Commissioner, and as a creditor of the contractor.

The committee adjourned.

MEMORIAL

OF

CALIFORNIA STATE GRANGE

AND

MECHANICS' DELIBERATIVE ASSEMBLY

ON THE

STATE UNIVERSITY.

T. A. SPRINGER.........STATE PRINTER.

REPORT OF ASSEMBLY COMMITTEE

ON

STATE HOSPITALS.

G. H. SPRINGER.........STATE PRINTER.

REPORT.

Mr. Speaker: The Assembly Committee on State Hospitals respectfully report, that they, in accordance with their duties, visited and inspected the following institutions located in San Francisco. The first in order was the

HOME OF THE INEBRIATE,

Partially supported by State, and partly from donations and county aid. The establishment is kept in good condition, and seems to be suitable for the purposes it was intended for. The following tables will show the receipts and expenditures, and also the number of those treated, as shown by the books, from December first, eighteen hundred and seventy-one, to December thirty-first, eighteen hundred and seventy-three:

Number of patients received	758
Admitted during January, eighteen hundred and seventy-four	37
Total	795

Amount received from State	$4,000 00
Amount received from City of San Francisco	6,000 00
Amount received from donations	1,908 00
	$11,908 00
Amount expended, at $450 per month, two years	10,800 00
Balance in favor of institution	$1,108 00

It is due to state that the expense account does not cover expense of repairs to building or replenishing furniture.

The next establishment visited was the

SAN FRANCISCO FEMALE HOSPITAL,

Located on Clay street, and under charge of Dr. C. T. Deane. The hospital was found, on inspection, to be in a cleanly condition, and apparently well managed. The following statements furnished by the

Physician and Treasurer will show the number of patients, and the disbursement of funds intrusted to the Board of Directors, viz:

Physician's report for the two years ending December thirty-first, eighteen hundred and seventy-three:

Admitted		371
Discharged, cured	351	
Died	3	
Remaining in hospital	17	
		371
Births	207	
Other diseases	164	
		371

Of the three hundred and seventy-one admitted, one hundred and eighty-three were residents of this county (San Francisco), and one hundred and eighty-eight were residents of other counties or States.

Besides the above, the poor were treated in the dispensary of the hospital every morning, from ten to eleven A. M., and when not able to buy medicine it was furnished by the hospital.

(Signed:) C. T. DEANE, M. D.

San Francisco Female Hospital in account with Anna M. Conkling, Treasurer, for two (2) years:

RECEIVED.

State appropriation	$8,750 00
Calico ball	2,750 00
Fair	2,185 00
Donations	2,176 00
	$15,861 00

DISBURSEMENTS.

Rent, water, gas, fuel, medicines, salaries, provisions, expenses of ball and fair, etc	$15,171 00
Cash on hand	690 00
	$15,861 00

Respectfully submitted,

(Signed:) ANNA M. CONKLING,
Treasurer S. F. F. H.

THE SAN FRANCISCO FOUNDLING AND LYING-IN HOSPITAL,

Located on Jessie street, and under charge of Doctor Hardy, was the next institution visited.

The following tabular statements, taken from the books, will show the receipts, expenditures, and number of patients received and discharged, for the years eighteen hundred and seventy-two and eighteen hundred and seventy-three:

RECEIPTS—1872.

Cash in treasury, January 1st, 1872	$348 65
Money received from all charitable sources	2,184 98
From patients	471 00
Total receipts for 1872	$3,004 63

RECEIPTS—1873.

From all charitable sources	$2,516 50
From patients	510 00
From State of California	4,500 00
	$7,526 50

EXPENDITURES—1872.

Wages of nurses and servants	$1,755 47
Rent	1,200 00
Groceries and provisions	1,243 15
Gas, water, fuel, medicines, etc	862 63
	$5,061 25

EXPENDITURES—1873.

Rent	$1,200 00
Wages	2,069 95
Groceries and provisions	1,915 51
Water, gas, etc	934 50
	$6,119 96

RECAPITULATION.

Total receipts	$10,531 13	
Total expenses	11,181 21	
Expenses over receipts		$650

Number of mothers confined	13
Number of children born	141
Number of children deposited at the door	94
Number of children still-born	1
Number of children died	2
Number of children taken away by mothers	4
Number of children given away, under Act of March 18th, 1870	6

The books of the institution show that over one half of those received for treatment, are from counties outside of the County of San Francisco.

The condition of the hospital, as far as it was possible to observe, appeared satisfactory.

THE CALIFORNIA STATE WOMEN'S HOSPITAL

Next attracted attention, and as far as neatness and cleanliness is concerned, the same words as applied to the institutions previously referred to can be used. There was found in this establishment, twelve (12 patients, but as no printed or written report could be obtained, it is found impossible to give a detailed statement of receipts and expenditures, or of the number of persons aided during the past two fiscal years.

THE MAGDALEN ASYLUM,

Having received State aid, was visited and inspected. This institution is a reformatory school for incorrigible young females, and receives both State and county aid—the former to the amount of eight thousand dollars during the past two years; the latter, at the rate of fifteen dollars per month for each inmate confined therein by order of the Police Judge of San Francisco. The number of inmates in the asylum at the date of your committee's visit, was one hundred and thirty two (132), the majority of whom were being instructed in various branches of industry suitable to females, with a view that, on the expiration of the time of their incarceration, those discharged would be able, if desirous, of leading a virtuous and respectable life. Extraordinary neatness was observed in all the departments of this asylum, and the discipline—mild, but positive—tends greatly to the successful social redemption of those who, in their youth, have been led into evil ways.

THE INDUSTRIAL SCHOOL,

Also of a reformatory character, for boys, aided by both State and county appropriations, was next inspected, and found to contain two

hundred and eleven (211) inmates. This institution is directly under the control of the Board of Supervisors, who elect the Superintendent, and other officials, and, by committee, disburse the amount applied to properly conduct the school.

The annual expense of the institution is, in accordance with the books exhibited, as follows:

Expense per annum	$27,131 08
Deduct amount received from shoe department	2,453 86
	$24,677 22

The boys, of all ages, are instructed, as far as possible, in the trades of shoe making and tailoring; the former giving a slight revenue; the latter, providing the clothing for the inmates. The establishment appeared to be overcrowded, though it presented a neat and cleanly appearance. Although your committee is not prepared to suggest a better way of dealing with this class of boys, yet we are not satisfied that the plan adopted is the best that can be devised. It is certainly a melancholy sight to see between two and three hundred boys, some of tender years, incarcerated inside of the prison walls. The subject is one of grave importance, and worthy the attention of every friend of his race and State.

The next institution in order was that of the Protestant Episcopal Church Home Association, or, as it is more commonly called,

THE OLD WOMEN'S HOME.

In this establishment there was observed fifteen occupants, of various ages, the average being sixty-five (65) years. Most of the inmates are very feeble, and those of extreme age, bed-ridden. The building and surroundings are kept in proper order, and appeared to conduce to the comfort of those residing there.

THE LADIES' PROTECTION AND RELIEF SOCIETY,

Located on the corner of Post and Franklin streets, next received the attention of your committee, having received, in former years, State aid. In this institution there was found one hundred and eighty-three (183) children and three grown persons; the majority of the former being of very tender years. The following statement will show the receipts and disbursements during two years ending September first, eighteen hundred and seventy-three.

RECEIPTS AND DISBURSEMENTS.

Amount received from all sources	$36,641 47
Amount disbursed	36,553 77
	$87 70

The condition of the establishment was found satisfactory, and the occupants appeared as if properly cared for.

The Almshouse and County Hospital, though not receiving State aid, were visited and found to be model institutions. The buildings, grounds, and surroundings are everything that could be desired for an institution of the kind, and after a careful examination we believe the management to be good. The hospital reflects honor on the city and State, as well as those in charge. We also visited the Almshouse, situated in San Francisco. The establishment throughout is a model of its kind. Too much credit cannot be given the city and the parties in charge for the manner in which this noble charity is conducted. We believe the city has been fortunate in securing the services of Mr. and Mrs. Heating as Superintendent and Matron. Your committee was surprised at the small cost of maintaining this institution.

Your committee, after due deliberation, recognizing the fact that all of the institutions visited and inspected are of a nature meeting with our warmest sympathies; yet, the practice inaugurated by previous Legislatures, making large appropriations to establishments over which the State has no control, meets with our disapproval, and the committee would recommend that, as soon as possible, without doing injustice or injury to those deriving benefits from such institutions, such appropriations be discontinued.

PAULSELL.

MEMORIAL.

To the Senate and Assembly of the State of California:

In accordance with the accompanying resolutions of the State Grange of California, and the Mechanics' Deliberative Assembly of San Francisco, the following petition has been prepared:

RESOLUTIONS OF STATE GRANGE.

OFFERED BY W. H. BAXTER.

Resolved, That a committee of three be appointed on the subject of agricultural education. Said committee to inquire particularly into the condition of the Agricultural Department of the State University—what improvements, if any, should be made, and what legislation, if any, is required to secure to the farmers of the State the full benefits of the Agricultural College grant.

Resolved, That the true meaning and intent of the Congressional grant (see Act of eighteen hundred and sixty-two), was to establish primarily "Agricultural" or "Mechanic Arts" Colleges, and that the funds derived therefrom should be first applied to these purposes, and that the State should render such aid as may be necessary. Such colleges should be mainly under the control of men engaged in these pursuits, and should be practical as well as theoretical.

Adopted. University Committee: J. W. A. Wright, W. H. Baxter, O. L. Abbott.

RESOLUTION OF MECHANICS' DELIBERATIVE ASSEMBLY.

PRESENTED BY JUDGE E. D. SAWYER.

WHEREAS, The Congressional Act of eighteen hundred and sixty-two, granting lands to the several States, had for its object the promotion of liberal and practical education of the industrial classes; and whereas, this State, in accepting the grant and establishing the University of California, made provisions for a College of Mechanic Arts, and a College of Agriculture, thus guaranteeing to the people of the State practical instruction in these pursuits; therefore, *Resolved*, That a committee of three be appointed to make such inquiry as may be proper as to what can be done, or what legislation is necessary to secure to the industrial classes, through the State University, its educational advantages.

The resolution was adopted, and E. D. Sawyer, C. C. Terrill, and M. J. Donnovan appointed on the committee.

Your petitioners, in furtherance of the above views, and in behalf of the industrial classes of California, both agriculturists and mechanics, would respectfully call the attention of your honorable body to the condition and wants of the State University.

We make this petition with all due deference to the Honorable Board of Regents and Faculty of our University, and with no desire to interfere improperly with any of their rights or duties. But we believe the interests of the people of the State, for whose benefit especially this noble institution was established, require that greater efficiency be given to the agricultural, mechanical, and other industrial instruction therein, *without diminishing the usefulness of those departments already in successful operation.*

Your petitioners find that the State University resulted from an Act of Congress entitled "An Act donating public lands to the several States and Territories which may provide Colleges *for the benefit of agriculture and the mechanic arts.*" By this Act, one hundred and fifty thousand acres (more or less) were donated to California.

In accordance with this munificent provision of the United States Government, our Legislature passed an Act establishing a University, and prescribing that its most *prominent features* should be Colleges of Agriculture and the Mechanic Arts.

By reference to the last report from each of the thirty-eight States which have shared in this national endowment, to the Department of Agriculture, at Washington, we find nearly every one of them carrying out both the letter and spirit of the Act of Congress; "that they are attended by over three thousand students, most of whom are practically pursuing agricultural and mechanical studies," with well stocked farms, workshops, and all necessary appliances of instruction.

In the same report, we read that "in California a farm of about two hundred acres has been provided for the Agricultural Department, but it has not been improved, nor are students instructed in agriculture outside of the school-room."

The Act of Congress requires that the "*leading object*" of the Industrial Universities shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislatures of the States may respectively prescribe, in order to promote the liberal *and practical* education of the industrial classes *in their several pursuits.*

The organic Act creating the University requires that the College of Agriculture shall first be developed, "and next, that of the Mechanic Arts." We find that of the monthly appropriation (six thousand dollars) for the regular expenses, only *one twentieth* is now devoted to the Agricultural Department, and that one Professor is discharing all the duties of instruction on the subjects specially related to it. *No technical instruction in the mechanic arts has thus far been given.*

The instructional force of the University (besides the President) is as follows:

One Professor of Latin and Greek, and two Assistants.
One Instructor in Hebrew.
One Professor of Mathematics, and two Assistants.
One Professor of Modern Languages, and two Assistants.
One Professor of Chemistry, and two Assistants (advanced students).
One Professor of Physics and Mechanics.
One Professor of Geology and Natural History.
One Professor of Civil Engineering and Astronomy.
One Professor of Rhetoric, History, and English Language.
One Instructor in Drawing.
One Professor in Agriculture, Agricultural Chemistry, and Horticulture.

Your petitioners do, therefore, request, that in accordance with plans pursued at Cornell, the Massachusetts and Michigan Agricultural Colleges, the Universities of Missouri, Illinois, and many others (as may be seen from the report already referred to), that whatever State aid is granted for our University, and as rapidly as the income from the land sales is received, it may be "*first of all* applied to the extending of the Colleges of Agriculture and the Mechanic Arts, and all the departments of instruction which directly bear upon the studies pursued in them."

With this object in view, we earnestly recommend a sufficient appropriation to carry out the following objects:

First—The improvement of such portions of the University grounds as may be required to illustrate *practically* the subjects taught in the Department of Agriculture, and the adaptation of this State to various cultures. The erection of a plain, convenient, and commodious farm house, with suitable outhouses, to be occupied by the Professor of Agriculture, or some practical farmer to act under his direction. To this an orchard, vineyard, vegetable and flower garden, and a poultry yard should be attached; also, a propagating house, and, as soon as practicable, a conservatory. The culture of all cereals, textiles, and other valuable vegetable productions; the rearing of stock, bees, and silkworms should be illustrated, on a small scale, epitomizing the entire range of agricultural industries.

Second—The appropriation of a sufficient amount to secure the necessary *practical* instruction in the mechanic arts; to provide blacksmiths', carpenters', cabinet, and machine shops, and printing press, under the supervision of competent persons.

We by no means expect to accomplish all this at once, but we ask means to secure to the youth of our State, with proper economy and dispatch, the advantages enjoyed by students of the best developed institutions which owe their existence to the same foundation. We desire that the grounds of our University, its museum, parks, and gardens, may eventually become as instructive as those of the Garden of Plants at Paris; and that our College of Mechanic Arts may, without needless delay, rival the Technological School in Boston. We ask that in keeping with the educational standards of the age, the principles of object teaching and practical instruction be conducted in connection with the ideal and theoretical, and occupy in the chief school of the State the position which their importance demands. We believe that nowhere will the dignity of labor be so strongly impressed upon the mind as in those higher institutions of learning, organized for the benefit of the most important class of laborers, where the acquisition of skill goes hand in hand with the acquisition of knowledge.

We find that the Board of Regents, as at present constituted, does not sufficiently represent the various portions and interests of the State. Though composed of gentlemen of the highest position and worth, they reside, mainly, in San Francisco and Oakland, and, although they have been zealous in their efforts to secure the prosperity of the institution, we believe that the best interests of education would be promoted by an amendment of the Act so as to unify the University with the other departments of State education. We therefore respectfully ask such amendment of this Act, and of other Acts, as shall constitute a State Board of Education, having charge of the University, the Normal School, and other public schools, and to consist of fifteen Regents, viz: Seven ex officio—the Governor, Lieutenant Governor, Speaker of the Assembly, State Superintendent of Public Instruction, President of the State Agricultural Society, Master of the State Grange, and President of the Mechanics' Institute of San Francisco; also, two members from each Congressional District, to be appointed from their districts by the Governor, with the consent of the Senate, for their first terms, and afterwards to be elected by the people as vacancies occur. We would further recommend that the term of office should be four years, and that one half should be elected every two years. We also recommend that any nine members shall constitute a quorum, as the Board of Education, or as the Board of Regents for the University, or as the Board of Trustees of the State Normal School. We ask that they be so selected as to represent the various industrial interests, occupations, and professions of the citizens of the State.

The law (Article Four, section fourteen hundred and fifty of the new Code), clearly provides that the Secretary of the Board of Regents must be a practical farmer, and must reside and keep his office at the site of the University. These requirements having been hitherto disregarded, we recommend that the law be either rigidly enforced or essentially modified.

It is generally understood that a portion of the lands donated by Congress for the purposes of industrial education in California, have been sold at five dollars per acre, one fifth of the amount having been paid down, and it is understood that the fund thus obtained has been used in paying Professorships and scholarships in our University. But it is the misfortune of the people of California to know very little about these lands and their present condition, while they do know that in other States, in consequence of mismanagement, only a small part of the real value of school and University lands has been realized. In some instances timber lands valued at thirty and fifty dollars per acre have been taken up, the first payments made, the timber removed, and the lands forfeited. It is clearly the right of the people to have correct information on this subject.

We do therefore petition your honorably body that a University Committee be carefully selected from your number, whose duty it shall be to examine fully, minutely, and impartially into the location and present condition of all lands donated to California for these purposes; to ascertain what has accrued from the sales thereof, and how the same has been expended; and that the necessary power be granted them to send for persons, books, and papers, to administer the necessary oaths, and take the testimony for the thorough investigation of the whole

question, and that the results of such investigation be published without unnecessary delay, for the information of the people.

In view of the important fact that another bill was introduced into Congress, at the late session (by Mr. Merrill, the author of the original bill; see Agricultural Report, pp. 348, 872), which it is expected will be passed during the coming Winter, giving to each of the industrial Universities in operation an additional grant of five hundred thousand acres, we also request that our Legislature memorialize Congress so to amend the law regarding the locations upon unsurveyed lands as to protect actual settlers in their improvements up to the time that the locator can make his selection by sections or subdivisions.

As a means of redress for past seizures under the existing law, we also recommend that our Legislature forthwith pass an Act, providing that in all cases where contests have arisen, or may hereafter arise, before the Board of Regents of the University upon the University lands, and the contestant shall feel aggrieved at the decision of said Board, he shall have the right of appeal to the District Court by giving the usual notice of said appeal.

We respectfully recommend that all the University funds be kept in the State Treasury, subject only to order in proper form for University disbursements.

As we are now informed that the funds hitherto appropriated are exhausted, and that additional appropriations will be required at the present session to add other and needed improvements, in accordance with the original plan, your petitioners would respectfully ask that in addition to the sum required for monthly current expenses, the following be *specifically* appropriated:

For farm, buildings, implements, stock, etc., twenty-five thousand dollars.

For *annual* farm and garden expenses, payment of students and other labor, salary of farmer and gardener, expenses of lectures from experts in special cultures, agricultural, entomology, veterinary science, etc., collection and preparation of specimens for museum of agriculture, and incidental expenses, fifteen thousand dollars.

For mechanical shops, printing press, steam engine, and their appurtenances, fifty thousand dollars.

For annual expenses of mechanical shops, printing press, superintendence, students, and skilled labor, collections of models and raw materials for Museum of Mechanic Arts, lectures on technical subjects connected with mechanical pursuits by skilled persons, and incidental expenses, fifteen thousand dollars.

It is expected that this will furnish the carpenters', cabinet work, and printing for the institution.

It should be borne in mind that these departments are to be created, and that no part of the twenty thousand dollars already expended for chemical and physical apparatus will supply their technical needs.

The completion of the central building, according to the original plan, is a prime necessity in accomplishing the great purpose of the University; for, in the absence of suitable rooms for the present Museum and Library, it has been considered necessary to occupy for this purpose a part of the College of Agriculture, a building designed to supply the wants of this department, as is indicated by the appropriate and bountiful emblems which adorn its outer walls. In this exigency the entire Agricultural Department is forced into the limited space of the north half of the basement of this splendid structure, thus placing in a subordinate position which it was never intended to occupy, what should be the most prominent department of the State University.

We find that a building containing an Assembly Hall, Museum, etc., can be *erected of wood* at a cost of one hundred and fifty thousand dollars; of brick, with granite facings, two hundred and fifty-six thousand dollars.

The labor of students can be utilized in the construction of this and other needed edifices, and deserving young men can in this way be aided in paying a part at least of the expenses of their education.

Suitable dwellings should be at once erected for the accommodation of the Professors and club houses for the students, upon the University grounds, for which a moderate rent might be charged. At present, both Professors and students are compelled to live at Oakland, five miles distant, or to provide themselves accommodations in the yet sparsely settled neighborhood of Berkeley, at an expense greater than their means will justify. The entire energies of the University body should be concentrated in and around its scholastic home.

In conclusion, we would repeat that it is not our object to undervalue what has been so well done in the erection of buildings, of which the State may be justly proud; in opening the doors of the University to both sexes; in making its instruction in all departments free; in organizing the Military Department and Labor Corps; and in securing a Faculty of zealous and able men. But, believing that the first and highest employment of men is to feed, shelter, and clothe the world, we ask that the graduates of our industrial colleges may be "peers of scholars in mental culture," and peers of laborers in manual skill and physical development.

The relations of labor to study are admirably stated in the Report of the Missouri University: "The pupil must study till he knows what should be done, why it should be done, and how. When this is done, the *intellectual* division of education is finished. The pupil must labor until he can do work in the farm and shop with skill; then the *manual* division of an industrial education is finished. In agriculture, he should thus learn whatever is done on the farm, in the garden, orchard, and nursery. If it is asked: "Who shall direct the labors of the pupils?" We answer: "The teacher of the principles put in practice, that useless and impracticable theories may not be introduced."

Agriculture is far from being an exact science, and its conditions on this coast are peculiar. We ask that our University be made useful to the largest number of our citizens, by accurate annual reports of work done, experiments made, and results arrived at.

Agriculture, in its various departments, should be so taught and practiced in our University as to send forth scientific farmers, whose labor and skill can utilize the soil and develop its greatest resources, while the mechanical department should *graduate* learned and skilled mechanics, who shall add dignity and worth to labor; and it is the earnest desire and purpose of the agriculturists and mechanics of this State to make these great departments of industry the leading features of our State University, and for this purpose we expect your cordial coöperation, and such appropriations as are necessary.

Nor do we think that any mechanical schools in San Francisco, valuable as they may become, can supply the place of the College of Mechanic Arts, as provided for by the original plan of the State University.

We also request the present Legislature to order, that block letters be prepared and placed upon the east and west faces of the main building of the University, marking it for all time with the words, "AGRICULTURAL COLLEGE OF THE UNIVERSITY OF CALIFORNIA."

J. W. A. WRIGHT,
W. H. BAXTER,
O. L. ABBOTT,
Committee of State Grange.

E. D. SAWYER,
M. J. DONNOVAN, ESQ.,
CHAS. C. TERRILL,
Committee of Deliberative Assembly.

To the Executive Committee, California State Grange:

Your committee, appointed in accordance with a resolution adopted by the State Grange at its last session, herewith submit this memorial as their report on the measures contained therein.

J. W. A. WRIGHT,
W. H. BAXTER,
O. L. ABBOTT.

Resolved, That the within report be received and adopted.

Carried.

To the honorable the Senate and Assembly of the State of California:

The Executive Committee of the California State Grange hereby respectfully recommend that your honorable body take immediate action to carry into effect the measures proposed in this memorial.

J. M. HAMILTON,
J. C MERRYFIELD,
A. B. NALLEY,
H. B. JOLLEY,
G. W. COLBY,
J. G. GARDNER,
Executive Committee of California State Grange.

MEMORIAL

FROM THE

MECHANICS' STATE COUNCIL

IN REFERENCE TO

STATE PRISON LABOR.

T. A. SPRINGER.........STATE PRINTER.

REPORT.

Dec 24 1873 -

MECHANICS' STATE COUNCIL.

Last Tuesday evening the Mechanics' State Council met, pursuant to notice, President A. M. Winn in the chair, and John D. Condon, Secretary pro tem. The Committee on Prison Labor made the following report:

Your committee, appointed to inquire into and report upon the contract system adopted by the State, in relation to convict labor, have examined the report of the Lieutenant Governor, as made in July last, in relation to the management of the State Prison. At that time there were nine hundred and thirty-one prisoners, five hundred and thirty-one of them working under contracts which require the contractors to take a definite number, with the privilege of more, if they desire. Of the number, fifty are shoemakers, two hundred cabinet makers, one hundred and twenty-five harness makers, sixty-five brick makers, and twenty wagon makers, being three hundred and sixty in all—the optional increase, one hundred and seventy-one, making the whole number five hundred and thirty-one. Governor Pacheco assumes the position we desire, as he recommends that the State work its own prisoners, instead of letting them out to contractors.

When we are informed that the prison is too small by five hundred cells, we wonder why any of them are hired out. They are now keeping three hundred and nineteen prisoners in nine rooms. The smallest number in each is twenty-two, and the largest number, forty-five. Comment on this condition of things is unnecessary, for all will see the impropriety. The scarcely guilty to be indiscriminately mingled with the hardened criminals, would become a school of crime instead of reformation. We recommend a complete change in the system, so as to make the State compete with Chinese labor, in cases where they have monopolized any particular branch of business, and thereby decrease the price still lower, so as to make it unprofitable to employ that class of labor. Chinese labor now has the complete monopoly of doors, blinds, and sash of regular sizes; also, cigars, cigar boxes, coarse clothing, and some other trades. The whole manufacturing in such classes of business has gone into the hands of men who are nothing but Mongolians, with a few white mechanics to teach them and to act as foremen. The State has the room and power for conducting the busi-

T. A. SPRINGER.........STATE PRINTER.

REPORT.

Dec 24. '73 -

MECHANICS' STATE COUNCIL.

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COST OF MANUFACTURING, ONE WEEK.

1,800 doors, 54,000 feet lumber, at 4½ cents per foot	$2,430 00
2,000 windows, 14,000 feet lumber, at 4½ cents per foot	630 00
600 pairs outside blinds, 7,200 feet lumber, at 3 cents	216 00
100 sets of inside blinds, 2,000 feet lumber, at 5 cents	100 00
Glue, $6; nails, $20; blind wire, $20	46 00
Glass for 2,000 windows	3,000 00
Putty and setting glass	300 00
Wear of machinery	40 00
Rent of sale store	75 00
Three hands at sale store	75 00
Pay roll for 100 men in the shop	1,200 00
Total cost for making	$8,112 00

SALE OF ARTICLES MADE.

1,800 doors, at $2 75 each	$4,950 00
2,000 windows, at $3 each	6,000 00
600 pairs outside blinds, at $2 50	1,500 00
100 sets of inside blinds, at $4 50	450 00
Total	$12,900 00
Deduct cost of making	$8,112 00
Leaves profits for one week	$4,788 00

This estimate is for a private workshop with average wages paid coolies, and the necessary white men. If this work is done by the State we must add to the profits the price of labor, being one thousand two hundred dollars; then the profits would be five thousand nine hundred and eighty-eight dollars on one hundred convicts per week. Suppose five hundred of the men now under contract at the prison should be employed in making articles as above stated, the profits per week would be twenty-nine thousand nine hundred and forty dollars. From this we must deduct one fourth for the difference between free and prison labor; then the profits would be twenty-two thousand four

hundred and fifty-five dollars per week, or one million one hundred and sixty-seven thousand six hundred and sixty dollars per annum. We learn from the State Prison Directors, that the entire expense of the State Prison for two years, was three hundred and fifty-five thousand seven hundred and eighty-four dollars, or one hundred and seventy-seven thousand eight hundred and ninety-two dollars per annum. When we deduct the latter sum from the profits on the labor of five hundred convicts, we have a profit of nine hundred and eighty-nine thousand seven hundred and sixty-eight dollars.

The expenses have exceeded the income from the prison, the enormous sum of two hundred and twelve thousand six hundred and ten dollars, or one hundred and six thousand three hundred and five dollars per annum. Thus we see that a change of this kind would not only make the prison self-sustaining, but make enough in one year to support the prison for five years, and then leave a handsome balance of one hundred thousand three hundred and eight dollars to pay the additional expenses of shop room and machinery. This estimate is astounding to us who are mechanics, and familiar with that kind of work, yet we have gone over the figures several times, and can see no mistake. Suppose, to be sure we are right, we reduce the profits to but one fifth of the estimate, then the prison would be self-sustaining, with a margin of one hundred and ninety-seven thousand five hundred and fifty-seven dollars per annum.

(There is another article of manufacture that might be introduced into the State Prison to advantage, without interfering with our mechanics. It is the making of heavy bagging for vegetables.) This would afford a market for hemp production, which yields wonderfully in this country. We have not been able to obtain estimates of cost in the manufacturing of bagging or carpeting, but it can be obtained by some little trouble and expense. The manufacture of tools and common cutlery might also be made profitable.

The amount of lumber and its cost is given very full, while the prices for articles made is below the average.

The committee cannot, in justice to themselves, close this report without expressing the opinion that a more liberal share of mechanics in the Legislature would insure much more economy in the administration of public affairs.

All of which is most respectfully submitted for your consideration.

P. M. WELLIN,
J. D. CONDON,
R. MOLLER,
A. M. WINN,
Committee.

DECEMBER 23d, 1873.

On motion, the report was received and agreed to, and the following preamble and resolutions adopted:

WHEREAS, The State Prison of California has been so regulated by law as to cost the State the enormous sum of one hundred and six thousand three hundred and five dollars per annum over and above the income, when it ought to have been self-sustaining and yielding a profit to the State; therefore, *Resolved*, That we believe the report of the committee has been carefully made out and may be considered reliable; therefore we direct that copies of it be sent to the Governor, Senate, and Assembly, now in session, and we recommend that the change suggested be adopted by the State in the management of the penitentiary.

Resolved, That the proceedings of this meeting be published in the *Shop and Senate*, and copies furnished to the morning papers, with a request that they publish A. B. Mullet's strong language.

The House Carpenters' proceedings were read and the following resolutions adopted:

Resolved, That we fully indorse the action of the House Carpenters' League and Shop of United Mechanics, in relation to A. B. Mullet, Supervising Architect of the United States, and unite with them in asking for his removal from office.

Resolved, That these resolutions, and a copy of the resolutions passed by the House Carpenters, be sent to Congress as the sentiments of this Council.

The Council then adjourned to meet again at the call of the President, if needed before the next regular meeting, which is on the second Wednesday of January, eighteen hundred and seventy-four.

The foregoing is a true copy of the proceedings of the Mechanics' State Council, at a meeting held in San Francisco, December twenty-third, eighteen hundred and seventy-three, and was directed to be sent to the Assembly of the State Legislature.

Given under our hand and official seal, December twenty-fourth, eighteen hundred and seventy-three.

A. M. WINN, President.

JOHN D. CONDON, Secretary.

REPORT

OF

THE CODE COMMISSIONERS.

February 28th, 1874.

T. A. SPRINGER.........STATE PRINTER.

REPORT.

To His Excellency, Newton Booth, *Governor of California:*

Sir: The Code Commissioners, having completed the task assigned by law, and the purposes of the commission having been attained, they beg leave to submit to your Excellency, and through you to the Legislature, this, their final report:

Every enlightened State, and every citizen thereof, feels it to be a necessity that its laws should be certain, exact, and accessible, not doubtful, inexact, to be found only in session Acts running through a series of twenty years, and in statutes, many of which have become *functus officio*.

The only source of relief is codification, systemizing, and classifying the laws, bringing forward the living spirit of the rights which may be enforced in our Courts of justice, separating therefrom the mass of enactments and principles which have spent their force or are repealed, and infusing them into maxims embodying the latest and best conditions of our jurisprudence.

Considered in the abstract a Code rearranging and reëxpressing our statute law, extracting from decided cases its reasons and stating them in general rules by authority of the Legislature, is a necessity.

All enlightened nations have felt that necessity, and with more or less success have attempted to put their laws in a convenient shape.

In primitive times, with limited or no commerce, with absolute governments, with little wealth among the people, without the art of printing, and no education among the masses, written Codes were of secondary importance, and the maxims, few in number, could be proclaimed in the public assemblies and remembered by the hearers.

As civilization advanced and property increased, as human rights became respected and difficulties were adjusted in Courts acting upon fixed rules, a knowledge of these rules, widely disseminated, became a necessity.

All systems of municipal law must, in the nature of things, be incomplete.

The Codes prepared by this Commission, modified by the Legislature, and enacted into laws at the last session, with the amendments and changes now suggested, constitute no exception.

Our choice lies between retaining the laws in their crude, undigested condition, hid away in its thousands of volumes, inaccessible to a large majority of the people, and codification.

So far as the Codes are a compilation of statutes, the work consists mainly of arrangement of former enactments under appropriate heads, pruning away excrescences, and adapting each provision to the exigency it was intended to meet, and, so far as they expound principles of law, they are collected and reduced into shape from reported decisions.

Without a Code, our laws are mainly to be found in the reported decisions of Courts, and to them we must refer in the settlement of conflicting claims.

These decisions are chiefly valuable for the reasons given for the decision, some conflicting with others, and none of them coming from the law-making power.

"Judiciary law" has become so bulky, and there is such a want of system and uniformity in it, that no lawyer, however skilled in his profession, could extract always the true rule.

Codes may be made compact and exact, coming as they must from the law-making power. Laws resting in decisions are necessarily narrow, applying only to the case in hand. Codes collect the principles established in a series of cases, and reduce them into maxims or canons forming genera, of which each reported case from which the rule was extracted is a species.

A well made statute is better than any reported decision containing its substance, but such statute is not necessarily an innovation.

Each decided case containing a just principle of law should be turned into a statute amending a Code, thus rendering it authoritative and accessible.

We say amending a Code, because if the provisions of the Codes are buried under subsequent enactments, their beauty and harmony are marred, their provisions rendered uncertain and inaccessible, and their usefulness impaired.

We do not claim that all the principles of law to be found in reported decisions, applicable to our system, have been collected and inserted in the Codes. On the contrary, very many subjects might be added and the subjects inserted enlarged or further amended.

In making such additions or emendations, the rule of law referred to should be clearly conceived, thoroughly digested, and written out in a concise form, so as to apply to and include as many contingencies as possible.

No Code can provide for all future contingencies, but if we now collect all the necessary rules of law found in decided cases and insert them in the Codes, and then as cases arise insert them in the Codes, we may, in the near future, have such a system of statute law as will approximate perfection.

As has been observed, it is impossible that any human labor should be beyond the reach of just criticism. Much has been said and much written since the adoption of the Codes, for and against them; but we believe that, in every instance, they have received the approval of careful and competent critics.

Before their adoption, they were submitted to an Advisory Board selected by Governors Haight and Booth, consisting of Charles A. Tuttle, of Placer, and Sidney L. Johnson, of San Francisco. Mr. Tuttle, a lawyer of learning and of large practical experience—the Reporter of the decisions of our Supreme Court—was peculiarly qualified for the position, and gave to the discharge of his duties on the Board his undivided attention. Mr. Johnson, a ripe scholar, learned both in the civil and common law, brought to his labors a mind rich in accomplishments, exact and critical.

After a careful examination of the work, they gave it their unqualified approval and indorsement, and "heartily recommended its adoption."

The Code of Civil Procedure, Civil, and Penal Codes, were submitted, before their adoption, to a joint committee of the two houses, composed of W. W. Pendegast, James T. Farley, James Van Ness, A. Comte, Jr., C. G. W. French, and F. E. Spencer, who gave to the Codes in question a full examination, and in elaborate reports their approval and indorsement. From one of their reports we quote as follows:

"Your committee believe that the system of law, as embodied in the Codes prepared by the Revision Commission, is more perfect than that prepared by any other State; and it would be well for the honor of California if, by the action of the present Legislature, it should adopt this great work, thus setting an example which will be speedily followed by all her sister States, adding new laurels to the fame which she has already so justly acquired, and at once becoming, as has been remarked, not only a lawgiver to the thousands within her borders, but to the millions who are to succeed them; and, by the force of her example, to not only the vast population of the whole Pacific Coast, but to the millions of citizens of other States, who will soon follow in her footsteps. Then, when the laws of all the States in this great federation are harmonious, and in sympathy with each other, California, having made the first advance toward this high aim, will be entitled to the first post of honor and the gratitude of the whole country."

The Political Code was referred to a select committee, composed of Senators William Irwin, George Oulton, Miles P. O'Connor, George C. Perkins, and S. C. Hutchings, and Assemblymen William R. Wheaton, John K. Luttrell, John A. Eagan, E. B. Mott, Jr., and W. N. De Haven.

This committee examined the Political Code carefully, line by line, reported it to the Legislature "with an unqualified approval and an earnest recommendation that it pass."

That these committees were competent, the names of the members composing them is a sufficient assurance.

When the Civil Code, the last work in the series, was placed upon its passage, Senator Tompkins, then Chairman of the Senate Judiciary Committee, and one of the ablest lawyers that ever held a seat in that body, said:

"As there will be no other opportunity, I desire to say a few words in relation to the bill now before the Senate and the work of the Commissioners, of which this is the final result. Those Senators who were here two years ago, will remember that I was not an advocate of the organization of this Code Commission. Past experience had taught me to believe that it was a dangerous experiment; and that the chances were that we would have as its fruits, large salaries and expenses to pay, and then an added uncertainty, rather than any definite rule, to aid us afterwards in the administration of justice in the State. Having entertained these ideas, I have watched the labors of the Commission with perhaps more interest, and certainly not with any stronger disposition to be pleased thereby, than would otherwise have been the case;

and I desire now, in justice to the Commission and myself, to say that I was entirely mistaken in the ideas that I entertained in relation to the organization of the Commission, and that, on the contrary, I now believe that they have done their duty faithfully, wisely, and well, and that although there will be errors to correct (doubtless some great ones, as who could do such a work and not leave traces of human infirmity behind them?); yet, sir, I believe, as a whole, it is the greatest and best step forward that the State of California ever has taken towards a perfect system of laws; and, therefore, with as much earnestness and sincerity as two years ago I opposed this movement, I now second the motion, that the rules be suspended and the bill passed by the Senate without further delay."

On the nineteenth day of March, eighteen hundred and seventy two, Mr. Pendegast, in the Senate, said:

"I arise to a question which is of the nature of a question of privilege; I desire to read to the Senate, and ask leave to have it spread upon the minutes, a telegram received this morning from one of the most able and distinguished lawyers in the country, in reference to the recent adoption of the four Codes by the Legislature. The telegram is as follows:

"'New York, March 18th, 1872.

"'*To the Commissioners for the revision of the laws of California:*

"'All honor to you for your great work accomplished. It will be the boast of California that, first of English-speaking States, she set the example of written laws as a necessary complement of a written Constitution for a free people.

"'DAVID DUDLEY FIELD.'

"I ask, Mr. President, that this dispatch may be spread upon the Journal of this Senate."

Mr. Tompkins said: "When it was my privilege a few days ago to express my own estimate of the work that these Commissioners had so well completed, I hardly expected that the opinion that I then expressed would be indorsed so promptly—I had almost said—from the other side of the world. It is to me a source of very great satisfaction and of pride—State and professional pride; and I therefore most cordially second the motion of the Senator from Napa."

After the Codes went into operation, criticisms adverse in their character often appeared in the public press; but in nearly every instance they were founded upon an entire misapprehension of the facts.

The first criticism of this character was based upon the assumption that the Codes contained a new and stringent "Sunday Law." Upon investigation it was found that the provisions of the Code upon the subject were reënactments of a statute that had been in force for years. Next, it was asserted that the Codes contained a provision in relation to the recordation of mortgages upon real property, which allowed one day for recordation for every twenty-five miles of distance that the mortgagor resided from the county seat. The person who started this had not read Part V of the Political Code, and hence did not know that

the provision in question applied to chattel personal mortgages alone, and was but the reënactment of a statute in force in this State from the earliest period.

The provisions of the "Election Laws" were severely criticised, but the operation of those laws dissipated all adverse criticisms.

The election laws come home to every person in the State; of them and their effect nearly all are competent to judge. It is but a fair presumption that if these laws were well drawn and beneficial, that the same was true of other provisions of the Codes.

The constitutional provisions relative to taxation presented difficulties in drafting a revenue law which could not be overcome, but under the revenue law embodied in the Code, valuations have been raised in the State from two hundred and fifty millions, under the old system, to nearly six hundred millions under the new; and excluding from consideration the taxes charged against the large monied corporations of San Francisco, taxes have been more closely collected and more cheerfully paid than ever before. Under the old system property in some counties was assessed at thirty per cent of its cash value, in others at its full cash value—the former contributing as a consequence to the support of the State Government less than a third of what was just, and the latter contributing their full proportion. Under the system contained in the Code this glaring wrong has been to a great extent remedied, and the provisions by which equality in taxation can be approximated are ample to cure the evil.

The State Board of Equalization this year will be almost able to bring about the desired results, and each year adding to the practical knowledge of its members will increase the efficiency of the Board.

It was feared by some that criticisms, however unfounded, might prejudice the present Legislature against the Codes; as to some extent the people had been prejudiced. To avoid this difficulty, and with a full knowledge that the Codes could stand the test, a Commission was appointed by the Governor, consisting of the Hon. Stephen J. Field, a Justice of the Supreme Court of the United States; Hon. Jackson Temple, an ex-Justice of the Supreme Court of this State; and the Hon. John W. Dwinelle, a member of the San Francisco Bar—all lawyers most distinguished for their legal and scholastic attainments. This Commission spent several months in examining the Codes, and in their report say:

"We found the four Codes—the Political Code, the Penal Code, the Civil Code, and the Code of Civil Procedure—as prepared by the Commissioners, and enacted by the Legislature, perfect in their analysis, admirable in their order and arrangement, and furnishing a complete Code of Laws; the first time, we believe, that such a result has been achieved by any portion of the Anglo-Saxon or British races. It seems inexplicable that those peoples who boast of being the most fully imbued with the sentiment of law, have left their laws in the most confused condition, resting partly in tradition, but for the greater part scattered through thousands of volumes of books of statutes and reports, and thus practically inaccessible to the mass of the people. That California has been the first of this class to enact a complete Code of municipal law, will add not only to the prosperity of her people, but redound to her honor as a State."

The testimony thus accumulated, standing uncontradicted by the testimony of a single competent witness, ought to be conclusive upon the subject.

We are not asserting that men in every respect competent have not, upon sections here and there, differed with the Commissioners as to their propriety—the contrary is the fact. A code of laws as complete as ours must of necessity embrace many subjects involving the gravest questions of public policy. Upon these questions there will, as long as independent minds exist, be the widest differences of opinion.

One may not be old, and yet remember well the day when the Code of Civil Procedure was adopted in New York. The legislative enactment that gave it life was regarded by a very large portion of the people of that State as a public calamity; the columns of the press teemed with adverse criticisms; the bar, always conservative, was astonished at the audacity of an Act that, by a single blow, struck out of existence a cherished system of practice; the Judges of many of the Courts, in their opinions, openly assailed the Code, avowed their intention to destroy it by judicial construction, and carried their threats so far toward execution that serious injury resulted to the public service; lawyers, who had sought positions on the Commission that framed the Code and were disappointed, vented themselves in assaults upon its provisions; others, who had prophesied that the Commission would fail, were chagrined at the success that crowned its labors. The spirit of envy, hatred, and detraction, seemed for a while to hold complete sway. In derision, the work was styled "Field's Code," "Field's mass of absurdities;" and ridicule, in every form, joined in the assault. But "time, at last, makes all things even." The Code contained within itself the germ of life that no power could destroy. State by State adopted its provisions, until, in nearly every State in the Union, it has superseded the old rules of practice. Borne across the ocean, an offering from ours to the parent country, the British Parliament have, in substance, adopted its provisions, and after the first day of November next the common law practice of England will in that country be numbered with the things that "have been," while the provisions of the Code of Civil Procedure will govern the "form of civil action" and give the "rule of practice" in the English Courts.

Not only has time vindicated the wisdom of the enactment, but the world has crowned with its laurel the authors of that Code. DAVID DUDLEY FIELD, the leading spirit of the Commission that framed it, but a few years since the target at which the shafts of its detractions were aimed, stands, to-day, in the estimation of the civilized world, the first lawyer of the age.

The Code of California had no such opposition to meet or overcome. Many of the lawyers of this State had been educated under the New York Code, and were the avowed advocates of a system of which it should form a part; a majority of the Judges of our Courts held the same views; our people, as a mass, were above the average standard of intelligence in other States or countries; the merchant in his counting-room, the farmer, and the artisan at his home, took up the Civil Code, and saw that it contained the rules stated in easy simplicity that were to regulate his civil conduct and rights, and at once appreciated the policy that substituted such a work for a system from which those rules could only be eliminated (if at all) by the student of law. Before the Code was adopted, it had received the approval of the great body of the people, and the Legislature, in giving it the form of law, but registered their edict.

Of course, there were some to object; strange that their numbers were not greater. Some to predict that all sorts of woes would attend its operations; to look forward to the first day of January, eighteen hundred and seventy-three—the day on which it would take effect—as a day fraught with disaster to the best interest of the State. But that day came and passed; the Code supplanted the old system, became the active living power in our system of jurisprudence, and, while it brought in its train many blessings, yet, as far as we now know, brought neither danger to any public interest nor to any private right.

During the progress of our work, in order to accurately determine and reduce to written law the leading legal principles, it was necessary to examine closely the text books and the reported decisions of the English and American Courts, and to make many notes, some of which contained the reasons which moved us to changes made; others, copious extracts from authorities supporting the text. No provision was made by law for the publication in the State edition of these notes. Their volume was about double that of the original text, and to have published them in the State edition, at the rates fixed by law for public printing, would have increased the cost of that work threefold. We did not feel disposed to assume that authority and involve the State in a large expenditure for which there was no warrant in law; but, believing (though others may differ from us) that such notes were worth preservation, two of the Commissioners took upon themselves the risk of publishing them in an annotated edition, and to this end, entered into a contract by which that publication could be made, and the volumes sold at the actual cost of publication (agents' commissions added).

To avoid all misapprehension as to their motives in making that publication (a wise precaution, as time has shown), they offered to the Governor and Secretary of State, for the State, the whole annotated edition at the exact cost per volume that the State edition cost the State—an amount which would just pay the expense of printing the edition—and suggested that the edition might be distributed to Justices of the Peace throughout the State, the Commissioners advancing the money and awaiting the action of the present Legislature for its payment. This offer the Governor and Secretary of State declined for want of power. We then fixed the price of the annotated Codes at a sum then estimated to be sufficient to reimburse our expenditures and pay the cost of sale, but which was, in fact, insufficient for that purpose. This price was at least sixty-six per cent less than any California publications have ever been sold for.

Every precaution was taken that the sale should in no manner interfere with the sale of the State edition, notice being given through the public press that it would not be issued until after the corresponding volumes of the State edition had been published and were on sale by the Secretary of State, and in no way whatever was intended to, or did it, interfere with the publication or sale of the State edition, or advance the pecuniary interest of the Commissioners, and, as a matter of fact, it has never cost the State in any way a single cent, or interfered with the sale of the State edition.

The Legislature at its last session continued the Code Commission, and, upon the adjournment of the Legislature, the Commissioners began the work of preparing for the printer a copy of each of the Codes, incorporating into each, in the form of notes, under the appropriate sections, all the statutes and parts of statutes passed by the last Legislature which affected or altered any of the provisions of the Code. This necessitated a thorough examination of all the laws (six hundred and thirty-seven in number) of eighteen hundred and seventy-one and eighteen hundred and seventy-two; the examination being rendered more difficult because they were not as then printed, and the Commissioners were compelled to read them in the manuscript condition and to make written copy of all the laws affecting any part of the Codes, in order that such laws might be furnished to the printer and incorporated in the Codes.

The work of copying the four Codes, consisting of fourteen thousand one hundred and sixty-five sections, or about twenty thousand one hundred and seventy-six folios, required much time and occupied two Secretaries constantly nine months.

The Federal and State Constitutions, the laws of the United States relating to naturalization and the authentication of writings, were all carefully head-noted and divided into convenient sub-heads and inserted in the appropriate Codes.

The time of each individual member of the Commission being thus taken up with preparing copy of the Codes for the printer, reading the proofs, collecting the laws of eighteen hundred and seventy-one and eighteen hundred and seventy-two, which affected the Codes, and compiling and head-noting the United States naturalization laws, and Acts relating to the authentication of writings, and the Federal and State Constitutions, it soon became evident that in order to complete the Codes within several months after they should go into operation, it would be necessary to procure additional clerical force to prepare carefully arranged alphabetical indexes to three of the Codes.

Curtis H. Lindley was employed on the first day of April, eighteen hundred and seventy-two, who completed the indexes of the Civil, Political, and Penal Codes in a very satisfactory manner. Mr. Lindley was discharged as soon as his work was completed, on the first day of January, eighteen hundred and seventy-three; the index to the Code of Civil Procedure, which was the last volume printed, being prepared by the Commissioners.

The Civil Code was the first printed, the first copy being furnished to the printer on the third day of June, eighteen hundred and seventy-two; the book being completed August fifteenth, eighteen hundred and seventy-two. The Political Code was completed October tenth, eighteen hundred and seventy-two. The Penal Code was completed December twentieth, eighteen hundred and seventy-two. The Code of Civil Procedure was completed March thirty-first, eighteen hundred and seventy-three.

The Commissioners have felt it their duty to speak thus accurately as to time and amount of work done, because they are aware that to the unthinking it might appear that a longer time was consumed in publishing the Codes than was necessary, but they feel confident that when it is reflected how great was the mere mechanical labor attendant upon the work, no one will be found who will say the publication was unnecessarily delayed. It is only necessary to add that the Commissioners and Secretaries were often employed for twelve and fourteen hours a day for weeks consecutively, in order to show how faithfully the members and clerks have performed their duties.

Besides publishing the Codes, the Commissioners were required by law to compile for publication all the general statutes continued in force by either of the Codes. The laws continued in force are more numerous than is perhaps generally understood. They consist of the following Acts:

All Acts incorporating or chartering municipal corporations, and Acts amending or supplementing such Acts;

All Acts consolidating cities and counties, and Acts amending and supplementing such Acts;

All Acts for funding the State debt, or any part thereof, and for issuing State bonds, and Acts amending and supplementing such Acts;

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All Acts in relation to Judges of the Plains;

All Acts creating or regulating Boards of Water Commissioners and Overseers in the several townships or counties of the State;

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All Acts dividing counties into collection and assessment districts;

All Acts allowing county, or city and county officers to appoint deputies, clerks, and subordinate officers, in so far as such Acts authorize the appointment, and fix the compensation of such deputies, clerks, and subordinate officers;

The numerous fee and salary bills of the various counties of the State, beside other laws specially mentioned and recognized as continuing in force by the Codes

The corporation laws of the State existing prior to the adoption of the Codes were continued in force for certain purposes, and the existence of corporations which had been formed before twelve o'clock, noon, of the first day of January, eighteen hundred and seventy-three, were not affected by the Code, unless such corporation elected to continue its existence under it, but the laws under which such corporation was formed continued applicable to all such corporations. (See Civil Code, Secs. 287 and 288.) The corporation laws of this State, as they existed before the adoption of the Codes, were therefore collected and published in the "Statutes Continued in Force." Wherever the Codes make provision concerning certain subjects in such cases, all laws relating to the same subject matter which were theretofore in force in this State, whether consistent or not with the provisions of the Code, are repealed.

In the "Statutes Continued in Force" the Commissioners have given a brief history of legislation which has been had upon various subjects, and where the Code has made provisions concerning such subjects, reference thereto is made, the sections of the Codes relating to the subject and superseding the prior law, being cited. All these Acts had to be gathered from the statutes, and necessitated a careful examination of each of the nineteen volumes of our general laws. In the arrangement of this book the alphabetical style was adopted, and it embraces a complete history of legislation, reference being made to every law which has ever been passed in this State, whether general or local; the work consists of over twelve hundred pages, referring to over seven thousand laws. The work was printed in that form so that, when taken in connection with the Codes, it would show the entire statute law of the State, and give a completeness and finish which the work of revision would otherwise have lacked.

The labor of preparing this volume of "Statutes Continued in Force," was fully as great as all the other work done by the Commissioners since the adjournment of the Legislature. In printing the Codes the subject matter was already prepared and required only to be copied, while in order to compile the "Statutes Continued in Force," it was necessary to carefully study statutes from eighteen hundred and fifty to eighteen hundred and seventy-two, and to extract therefrom the living laws, noticing conflicting provisions, and gathering them into a harmonious whole, so far as the same was possible. The volume is arranged, printed, and bound in the same general style as the Codes. Beside being alphabetically arranged, it is divided into Chapters and Articles, with head notes and marginal references, together with a carefully arranged index. It was compiled, furnished to the printer, proofs corrected, and its publication supervised, all within a period of nine months, and a casual glance at the book will show that this was very rapid work.

The other duties required by law of the Commissioners were, that as their work progressed they should notice any conflicts or incongruities which might occur in the Codes, prepare a bill which would obviate the same, and incorporate therein any new provisions of law which might be required to give completeness to the Codes, and to report such amendments to the Legislature now in session. As our work progressed we made drafts of such amendments as examination suggested.

The Commission then, in connection with the Commission appointed by the Governor, has been in almost constant session since November last, and the result of the labor is the various bills before you to amend the Codes, viz: A bill to amend the Penal Code, introduced by Mr. Pendegast; a bill to amend the Code of Civil Procedure, introduced by Mr. Cowdery; a bill to amend the Civil Code, introduced by Mr. Williams; a bill to amend the Political Code, introduced by Mr. Norton; a bill to amend the revenue provisions of the Political Code, introduced by Mr. Freeman; and a bill relative to roads and highways, introduced by Mr. Parker.

In the preparation of these bills the suggestions of members of the Legislature have been sought and received, and neither time nor labor has been spared to make them acceptable.

It is often said that the Codes will be endangered by the adoption of amendments proposed in the Legislature by its members. There is not the slightest danger of such a result; when the Codes approach, as they will in the future, perfection, every bill proposing a general law will come as an amendment to the Code. There is far less danger in legislating upon general subjects with a Code in force, from which it can be seen at a glance what the law is upon the subject, than it would be if there had been no codification, and the law upon the subject was uncertain, and rested in tradition.

The Code was the munificent gift of the Legislature of eighteen hundred and seventy-one and eighteen hundred and seventy-two to generations present and future; a gift that no hand can spoil, no power can ever retract. Though but two years have elapsed since its adoption, much of it has passed into the laws of our sister States and Territories, and the rest will speedily follow, so that in every State a "written law will be the complement of a written Constitution."

The Code of Justinian, rich with the accumulated wisdom of three hundred years of national prosperity, survived not only the changes made by law makers, but the ravages of time itself. Of Imperial Rome but a vestige remains—her monuments, palaces, and temples are prostrate, and of them scarce one stone is left upon another. But the Code is still intact, an enduring testimonial of the wisdom and learning of the people that gave it into being.

Against all adverse criticisms made upon the Code of California, we may, in its favor, allude to one fact capable of proof and incapable of refutation; namely, that it is the most complete and perfect Code ever given by the law-making power to any people. In the future, other English speaking people may add to it, enrich and adorn its pages with the wisdom of years to come, as the Justinian Code was enriched and adorned by the Latin races. But the Code of California, as it came from the Legislature of eighteen hundred and seventy-one and eighteen hundred and seventy-two, will ever be cited, referred to, and esteemed by the people of our tongue and race, as has been the Code of Justinian by the races which accepted it as the basis of a system of jurisprudence.

In the changes that time must bring, the names of all connected with the Code of California will pass away, the massive walls of the Capitol in which it was enacted will crumble into dust, the site of the Capitol may be lost to the knowledge of mankind, yet we may fairly indulge the hope that when such changes have taken place, California, in her Code, will have a monument which neither the iron hand of Time has shattered, nor the dust of many ages obscured.

Your Commissioners, in this behalf, only claim to have gathered the scattered leaves of the law, grouped them in order, and bound them in a volume; to have brought to the work the will and desire (prompted alike by State and professional pride) to discharge its duties to the best of their ability.

This Commission was organized in May, eighteen hundred and seventy, and concluded its labors in February, eighteen hundred and seventy-four. During this period its members have, in the discharge of official duties, been brought into intimate relations with the Justices of the Supreme Court, two sets of State officers, the members of the Legislature for two sessions, and of two Boards of Revision. It has been a source of gratification to the Commissioners that they have ever received from the officers and members referred to constant assistance and encouragement, and that not the slightest thing has ever occurred to mar the good feeling existing between them. To this fact, much of the success attending our labors may be attributed; and now, in taking leave of our official positions, we desire to express our sincere thanks for the many acts of kindness received at their hands.

The Commission appointed by your Excellency, consisting of Messrs. Field, Dwinelle, and Temple, brought to the work of examination and revision months of constant labor. The two last named gentlemen, for that purpose, gave up for the time a most lucrative practice, and Mr. Justice Field, in order that his services might be given to his adopted State, abandoned a trip to Europe that had long been in contemplation. The value of the labor, and the indorsement given to the Code by men of their standing and ability, cannot be overestimated.

CREED HAYMOND,
Chairman,
JOHN H. McKUNE,
J. C. BURCH,
Commissioners.

SACRAMENTO, February 28th, 1874.

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SACRAMENTO, February 28th, 1874.

REPORT

OF THE

CODE COMMISSIONERS

OF THE

STATE OF CALIFORNIA.

T. A. SPRINGER.........STATE PRINTER.

REPORT.

To His Excellency,
GOVERNOR BOOTH:

In accordance to the requirements of law (Stats. 1871–2, p. 483), the Code Commissioners have the honor to make the following report:

Immediately after the adjournment of the Legislature of eighteen hundred and seventy-one and eighteen hundred and seventy-two, the Commissioners proceeded in obedience to "An Act to put into effect certain parts of the Codes, and provide for their publication," approved March twenty-second, eighteen hundred and seventy-two, to have published the parts of the Codes which were put into effect by that Act, and completed the same on the twenty-second of April, eighteen hundred and seventy-two.

The Commissioners then began the work of preparing for the printer a copy of each of the Codes, incorporating into each in the form of notes, under the appropriate sections, all the statutes and parts of statutes passed by the last Legislature which affected or altered any of the provisions of the Code. This necessitated a thorough examination of all the laws (six hundred and thirty-seven in number) of eighteen hundred and seventy-one and eighteen hundred and seventy-two; the examination being rendered more difficult because they were not as then printed, and the Commissioners were compelled to read them in the manuscript condition and to make written copy of all the laws affecting any part of the Codes, in order that such laws might be furnished to the printer and incorporated in the Codes.

The work of copying the four Codes, consisting of fourteen thousand one hundred and sixty-five sections, or about twenty thousand one hundred and seventy-six folios, required much time and occupied two Secretaries constantly nine months.

The State Printer's office, as is usually the case immediately on the adjournment of the Legislature, was crowded with work. The Statutes of the session, the Journals of each House, the Appendixes to the Journals, the Spanish laws, the Supreme Court Reports, and many other matters being printed at the same time with the Codes, retarded the Commissioners very materially, so that it was impossible to complete the publication and proof-reading of the four Codes until the thirty-first day of March, eighteen hundred and seventy-three.

The Federal and State Constitutions, the laws of the United States relating to naturalization and the authentication of writings, were all carefully head-noted and divided into convenient sub-heads and inserted in the appropriate Codes.

The time of each individual member of the Commission being thus taken up with preparing copy of the Codes for the printer, reading the proofs, collecting the laws of eighteen hundred and seventy-one and eighteen hundred and seventy-two which affected the Codes, and compiling and head-noting the United States naturalization laws, and Acts relating to the authentication of writings, and the Federal and State Constitutions, it soon became evident that in order to complete the Codes within several months after they should go into operation, it would be necessary to procure additional clerical force to prepare carefully arranged alphabetical indexes to three of the Codes.

Curtis H. Lindley was employed on the first day of April, eighteen hundred and seventy-two, who completed the indexes of the Civil, Political, and Penal Codes in a very satisfactory manner. Mr. Lindley was discharged as soon as his work was completed, on the first day of January, eighteen hundred and seventy-three; the index to the Code of Civil Procedure, which was the last volume printed, being prepared by the Commissioners.

The Civil Code was the first printed, the first copy being furnished to the printer on the third day of June, eighteen hundred and seventy-two; the book being completed August fifteenth, eighteen hundred and seventy-two. The Political Code was completed October tenth, eighteen hundred and seventy-two. The Penal Code was completed December twentieth, eighteen hundred and seventy-two. The Code of Civil Procedure was completed March thirty-first, eighteen hundred and seventy-three.

The Commissioners have felt it their duty to speak thus accurately as to time and amount of work done, because they are aware that to the unthinking it might appear that a longer time was consumed in publishing the Codes than was necessary, but they feel confident that when it is reflected how great was the mere mechanical labor attendant upon the work, no one will be found who will say the publication was unnecessarily delayed. It is only necessary to add that the Commissioners and Secretaries were often employed for twelve and fourteen hours a day for weeks consecutively, in order to show how faithfully the members and clerks have performed their duties.

Besides publishing the Codes, the Commissioners were required by law to compile for publication all the general statutes continued in force by either of the Codes. The laws continued in force are more numerous than is perhaps generally understood. They consist of the following Acts:

All Acts incorporating or chartering municipal corporations, and Acts amending or supplementing such Acts;

All Acts consolidating cities and counties, and Acts amending and supplementing such Acts;

All Acts for funding the State debt, or any part thereof, and for issuing State bonds, and Acts amending and supplementing such Acts;

All Acts regulating and in relation to rodeos;

All Acts in relation to Judges of the Plains;

All Acts creating or regulating Boards of Water Commissioners and Overseers in the several townships or counties of the State;

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The numerous fee and salary bills of the various counties of the State, beside other laws specially mentioned and recognized as continuing in force by the Codes.

The corporation laws of the State existing prior to the adoption of the Codes were continued in force for certain purposes, and the existence of corporations which had been formed before twelve o'clock, noon, of the first day of January, eighteen hundred and seventy-three, were not affected by the Code, unless such corporation elected to continue its existence under it, but the laws under which such corporation was formed continued applicable to all such corporations. (See Civil Code, Secs. 287 and 288.) The corporation laws of this State, as they existed before the adoption of the Codes, were therefore collected and published in the "Statutes Continued in Force." Wherever the Codes make provision concerning certain subjects in such cases, all laws relating to the same subject matter which were theretofore in force in this State, whether consistent or not with the provisions of the Code, are repealed.

In the "Statutes Continued in Force" the Commissioners have given a brief history of legislation which has been had upon various subjects, and where the Code has made provision concerning such subjects, reference thereto is made, the sections of the Codes relating to the subject and superseding the prior law, being cited. All these Acts had to be gathered from the statutes, and necessitated a careful examination of each of the nineteen volumes of our general laws. In the arrangement of this book the alphabetical style was adopted, and it embraces a complete history of legislation, reference being made to every law which has ever been passed in this State, whether general or special; the work consists of over twelve hundred pages, referring to over seven thousand laws. The work was printed in that form so that, when taken in connection with the Codes, it would show the entire statute law of the State, and give a completeness and finish which the work of revision would otherwise have lacked.

The labor of preparing this volume of "Statutes Continued in Force," was fully as great as all the other work done by the Commissioners. In printing the Codes the subject matter was already prepared and required only to be copied, while in order to compile the "Statutes Continued in Force," it was necessary to carefully study statutes from eighteen hundred and fifty to eighteen hundred and seventy two, and to extract therefrom the living laws, noticing conflicting provisions, and gathering them into a harmonious whole, so far as the same was possible. The volume is arranged, printed, and bound in the same general style as the Codes. Beside being alphabetically arranged, it is divided into Chapters and Articles, with head notes and marginal references, together with a carefully arranged index. It was compiled, furnished to the printer, proofs corrected, and its publication supervised all within a period of nine months, and a casual glance at the book will show that this was very rapid work.

The other duties required by law of the Commissioners were that as their work progressed they should notice any conflicts or incongruities which might occur in the Codes, prepare a bill which would obviate the same, and incorporate therein any new provisions of law which might be required to give completeness to the Codes.

The Commissioners, with feelings of pleasure and pride, are enabled to say that no glaring defects have as yet been discovered in any of the Codes which have materially affected any public or private interest. The Codes have worked more smoothly than ever was anticipated by the Commissioners; the mere fact, however, that a revision of the laws had been made, drew down upon the work abundant criticisms from the Bench, the Bar, and the people generally. With but very few exceptions the provisions of the Codes which have thus been criticised and objected to were only reiterations and republications of the law as it stood prior to the adoption of the Codes.

It having been the avowed object of the Commissioners when compiling the Codes not to alter the existing laws, except where apparent

conflicts existed in, hardships were worked by, or serious inconvenience resulted from the workings of the old law. The fear of being accused of introducing changes in the law for no other purpose than for the bare sake of change itself, and a desire on the part of the Commissioners not to throw obstacles in the way of the passage of the Codes by the introduction of novel legal propositions, induced them to adopt as far as possible the language of the old statutes. To these parts of the Codes the legal critics have very justly directed their attention and called for a change so as to make it correspond with the newer theory of the Codes.

The Revision Commissioners were anxious that a committee of lawyers, skilled in their profession, should be appointed to review the work, point out its defects, and to suggest amendments and improvements. Your Excellency, in deference to the wishes of the legal profession and the earnest desire of the Commissioners, appointed Hon. S. J. Field, Justice of the Supreme Court of the United States; Hon. Jackson Temple, ex-Justice of the Supreme Court of this State; and Hon. J. W. Dwinelle, a committee to review the work. The members of the Code Commission attended the sittings of this committee in San Francisco, and were much gratified at the result of the labor of that committee; Commissioner Burch especially took up his residence in San Francisco, and was in constant attendance upon the committee for the purpose of explaining the Codes and to assist the committee in drafting amendments. The committee also elected the Secretary of the Code Commission, Cameron H. King, Esq., to act as their Secretary, and to assist in arranging their amendments. Many amendments were proposed to each of the Codes. These were printed in pamphlet form and circulated to members of the legal profession throughout the State. The Code Commissioners have carefully embodied the amendments proposed by that committee, enriched and improved by suggestions of eminent lawyers in various parts of the State, in a bill for an Act to amend the several Codes, which will accompany this report (or will be presented in a short time), which the Commissioners trust your Excellency will present to the Legislature and recommend its passage. The amendments proposed will obviate all conflicts or incongruities which may now exist and which have come under the notice of the Commissioners, and at the same time give a completeness to the Codes heretofore much needed.

In conclusion, the Commissioners acknowledge their appreciation of the services of their Secretaries, Cameron H. King and Will J. Beatty. In order to complete the work assigned by the Legislature to the Code Commission, it was necessary to retain the services of these gentlemen. They have been constantly engaged during the entire time up to the present moment, and have received no compensation for fourteen months of that time. No appropriation was made by the last Legislature to pay the salaries of these gentlemen, as it was then thought that the labor of the Commission could be completed by the first day of November, eighteen hundred and seventy-two, a matter since proven to have been utterly impossible. The incoming Legislature should make an appropriation for the payment of their services, and the services of Curtis H. Lindley, who completed the indexes to three of the Codes.

Finally, the Code Commissioners embrace this opportunity to return their sincere thanks for the courteous manner in which they have been treated by and for the great assistance which they have received from the hands of all the officers of the State Department, and especially from your Excellency.

The beneficial effect of a codified system of laws is already felt and acknowledged. The Election, the Revenue laws, and many other provisions of the Code which have been submitted to the severest tests, have, it is believed, given the utmost satisfaction, and to use the language of one of the most distinguished lawyers of the United States—a gentleman whose high standing in the legal profession is recognized throughout the civilized world—"It will be the boast of California that, first of English-speaking States, she set the example of written laws as the necessary complement of a written Constitution for a free people."

Very respectfully,

CREED HAYMOND,
Chairman.
JOHN C. BURCH,
JOHN H. McKUNE,
Commissioners.

CAMERON H. KING,
WILL J. BEATTY,
Secretaries.

SACRAMENTO, November 15th, 1873.

INVESTIGATION

OF

THE ASSEMBLY COMMITTEE ON ELECTIONS,

IN THE MATTER OF THE

SAN FRANCISCO CONTESTED ELECTION CASES.

G. H. SPRINGER.........STATE PRINTER.

TESTIMONY.

SACRAMENTO,
FRIDAY, February 13th, 1874.

Present—Norton, Chairman, and a full committee.

The following resolutions were offered and adopted:

Resolved, That the Committee on Elections now proceed to count the ballots in the San Francisco contested election cases, and that during the counting no parties shall be present except the committee, the committee clerks, the Clerk and Assistant Clerk of the City and County of San Francisco, and one counsel for each room where the counting is carried on, to represent each of the contestants and the sitting members.

Voted, That the Chairman appoint two members to conduct the counting in each room.

The Chairman appointed Messrs. Franck and Simpers to conduct the counting in the Attorney General's room; Messrs. Gray and McBride, Treasurer's room; Messrs. Ables and Venable, Controller's room.

TESTIMONY OF F. A. GIBBES.

F. A. GIBBES, called, sworn, and examined:

Mr. Hamill—Mr. Gibbes, please tell your name again, for the information of the reporter.

Answer—F. A. Gibbes.

Question—You were a candidate for the Legislature at the last election in San Francisco?

A.—I was.

Q.—You were one of the original contestants in this election case?

A.—I was.

Q.—Did you, or did you not, have a conversation with me and Judge Sharpstein, on the corner of Pine and Montgomery streets, in the City of San Francisco, about this election case, subsequent to the election?

A.—I presume I did; I had several conversations with you.

Q.—There is a particular one to which I refer.

A.—I don't know that I could state the conversation; I may not remember that particularly; but we had several conversations; a number of them.

Q.—Did you, or did you not, warn me to be careful and watchful of railroad influences, in the event of these ballots ever being counted?

A.—I presume I did; I do not remember exactly. I presume I did; but at the same time, I would like to go into a little more detail. I would like the committee to understand it better in reference to what conversation might have taken place in regard to it. I was a contestant in the case. I was the main contestant, and was carrying on the whole thing, I supposed, myself. I am sure I went into a thorough investigation of the facts. There I was convinced that the entire ticket—the Democratic ticket—was elected, with one exception. I had evidence enough to support that. I found that the Senatorial fight would probably come on before this could be decided. I, myself, could not go to the Legislature; my business, I found, prevented me. I was anxious to do Mr. Casserly what service I could. He had used my name to assist him, and in conversation with the parties, I found that Mr. Casserly would receive a portion of the vote of the delegation, as originally agreed, of the Dolly Varden ticket. I then told Mr. Sharpstein, and I told you, sir, after a conversation with Mr. Casserly, that I would withdraw entirely, as I would assist him all I could. Mr. Casserly said I was very generous, and he thanked me for it. I went then to you, and told you that I would withdraw all, and take no further part in it. You had previously had a conversation with me, and you said that upon contesting it, I would put you to a good deal of expense. If I remember, I told you that I would withdraw it entirely, and have nothing more to do with it; that I had had a great deal to do with politics in past life, and was sick and tired of it; and I then withdrew, and had nothing more to do with it further. But I remember having conversations in regard to that, and I at that time thought influences would be brought to bear. There were rumors upon the street to that effect, whether correct or not, that the railroad had taken a great part in it. I know in my election they had taken a very active part to defeat me. A ticket was put out by them with Mr. Casserly's name on—the Democratic ticket. As you will see, Mr. Estee ran largely ahead of his ticket; and I warned you and Mr. Sharpstein to be very careful. I will say now, however, that I believe nothing was done; in fact, I know that Major Harney took the greatest care of those ballots. I know when we wanted the ballots brought before the Justices of the Peace to have them counted there before the Justices of the Peace, he refused it, and said that he would not, under any circumstances, deliver them there; that he would only deliver them to the Legislature, and that only on a subpœna from the Legislature.

Q.—Did you assign any other reasons than those you have stated to this committee, to me, as a reason why you retired from the contest?

A.—I know of none other; you may suggest, and I may remember it.

Q.—Did you or did you not assert that one, and the principal reason, why you retired from the contest, was from the fact that the railroad people were presumed to be using influences against us?

A.—I don't think I did.

Q.—You don't think you did?

A.—No, sir.

Q.—You are very certain that you did not?

A.—Yes, sir; I am perfectly certain that I did not.

Q.—You did not?

A.—Most certainly and decidedly I did not.

Q.—There, then, or at any other time?

A.—Then, or at any other time.

Q.—Then you had only heard of rumors that the railroad people would use influences against us?

A.—That is all.

Q.—From whom did you hear those rumors?

A.—I could not tell; from dozens. It was merely not so.

Q.—Did you or did you not have any conversation with any of the other contestants in this case in regard to this matter, in which this railroad matter was discussed between you and them?

A.—I may have; I told S——, as I state here now, but I have never said that——

Q.—Did you or did you not, in such discussions, ever assert that the railroad influence in this matter would be thrown upon the side of the contestants, and against the members who at present hold their seats?

A.—Well, I dare say I did. That was undoubtedly my opinion; and I believed that if they exerted any influence on the ticket, such would be the way. Of course, they were opposing the Dolly Varden ticket, and did all they could against it.

Q.—You do not remember, or do you remember, distinctly, the conversation to which I allude?

A.—I do not remember it distinctly. We had a good many conversations; I do not remember distinctly the conversation.

Q.—You seemed to have a few evenings ago, or the evening before last, rather, when you came up into the room—you seemed to recollect the time and place, though you could not charge your memory exactly with the full story as you told it then?

A.—I did?

Q.—Yes, sir.

A.—I guess not; nothing more distinctly than I do now, and I am generally pretty correct in my recollection.

The Chairman—The member will not insinuate that the gentleman is testifying differently.

A.—I suppose my character is well established in the community, compared with his.

The Chairman—The witness will maintain order.

Mr. Hamill—Permit me to explain: I was directing the attention of the witness very clearly as to time and place, and jogging his memory in regard to that conversation that occurred between him and me in the Assembly Chamber.

The Chairman—It will be proper to call his attention to the time and place, but not to insinuate that he was making a different statement here on the stand from what he had made to you away from the stand.

Mr. Hamill—There is no denial of the conversation by the witness; it is only with regard to his recollection of the time and place.

The Chairman—Proceed with the examination.

The Witness—I will state that it was about— this must have been, I should think, in November, this conversation he refers to, and from that time to this I have given it no attention whatever; I stated that I would have nothing further to do with it, and dropped it entirely; I paid my lawyers and took their receipts, and said good-bye, and I will have nothing further to do with it.

Mr. Hamill—That is entirely correct, Mr. Gibbes.

A.—I may have—I cannot refresh myself—I dare say I did believe it, and, in fact, the whole of the papers in the city were filled with it; why, the papers were steeping with it; why, the *Call* and *Bulletin*, almost every day, appeared, saying the railroad would interfere, and to look out for frauds; and I think, if you will run through the papers, you will find very distinctly——

Q.—In regard to these matters, I am not referring to newspaper conversations or newspaper reports; I am endeavoring to charge your memory—if you recollect the conversation between yourself and these contestants upon this subject; I am endeavoring to draw your attention to the conversation—the especial conversation—you had upon this subject—to the warnings that you gave to me; and I am endeavoring to find out the foundations of them for the information of this committee.

A.—I did give you at that time the names of——

The Chairman—You will simply answer such questions as are asked you, and not argue with Mr. Hamill.

Mr. Hamill—I don't wish to argue with the witness at all; nothing of the kind.

The Chairman—You have said, Mr. Gibbes, that you were satisfied—that you became satisfied during your investigations—that the Democratic ticket, or the ticket then representing that side of the House here, had been elected?

A.—I did, sir, with one exception, I said.

Q.—What was the foundation of your conclusion; how did you arrive at it?

A.—I will tell you in a very few words, sir. I, myself, was appointed to take charge of the Eleventh Ward. I went around with my buggy, which was always at hand. I went to the different polling places at the close of the counting of the tickets. I was in the Ninth Precinct of the Eleventh Ward at one time when two scores of five were put wrongly against our ticket. I saw that myself, and called attention to it. The two clerks were at words about it—at variance—and they compromised it in that way. The Judge ordered them put over, and our protest was not taken—and that was wrong. I was in the Sixth Precinct of the Eleventh Ward, and saw one of the same kind against the Democratic ticket—a score of five against the Democratic ticket put in. I was in a precinct very near Woodward's Garden, just by the stable there, and I saw the same thing done there. That was four different times that I saw it done of my own knowledge. I investigated the others, one after another. Parties came and told me the same thing—came and gave me their evidence. Over there I see Mr. Arthur M. Ebbetts. He told me that in the Third Ward a friend of his saw ballots to the amount of about two hundred votes changed. While it was closed there nobody was allowed in there, which was contrary to law; and that his friend saw a change taking place in that ballot box of about two hundred votes. I saw Mr. H. H. Bigelow, the insurance company man. He told me the same thing had occurred, and told me to call Arthur M. Ebbetts on the stand and hear him, and that Ebbetts would say the same thing. I intended to have called upon him and a gentleman (Mr. Hamilton) who was present there also. I saw Mr. A. J. Bryant, and I had a conversation with Bryant about what he saw there. He said that in a ward there they were not allowed to see what was going on, further than this: "That he saw a pencil tied to the hands of one of the aids, and that they were gradually scratching them with pencils." I saw that such frauds as that were carried on in that ward, and I, myself, being so prominent in politics in this county in former times, holding the position of Chairman of the State and County Committee, the City Committee, and District Committee, and member of the

State Central Committee, and knowing these parties well, I inferred there were frauds of a glaring kind carried on against these parties.

Q.—Based upon rumors, except in the former instances that you speak of, of your own knowledge?

A.—Yes, sir.

Q.—All the rest was only rumor?

A.—Yes, sir.

Q.—How can it cut any figure in this investigation pending before this committee, when the ballots are to be counted, if they have been kept just as they were returned to the County Clerk?

A.—It may make none; and I am convinced, as I stated here, that there has been no tampering with those ballots after they have been in Colonel Harney's hands.

Q.—Then that is an answer to the question?

A.—Yes, sir; with the exception of that Third Ward. I think if an investigation was made into that Third Ward, the whole of the Third Ward would be thrown out, which would change the result somewhat.

Q.—You think so?

A.—I think so.

Q.—Do you oppose that upon rumor, or actual knowledge?

A.—Upon rumor—these statements I have made here.

Q.—That won't do for us to act upon.

A.—I don't know; you are a lawyer, and I am not.

Q.—I was curious to know how it could affect the result, inasmuch as the committee were to count the ballots, if they were not tampered with?

A.—I am convinced that the ballots have not been tampered with; and I am convinced that this course is the wisest and true course—that is, this course you have attempted—and will be satisfactory to the whole community.

Mr. Michael Hayes—You state, Mr. Gibbes, that you were informed by Mr. Ebbetts, and others, that they had seen ballots tampered with. In what manner do they suppose the ballots were tampered with?

The Chairman—I don't propose to go into that investigation before the committee, if it is unimportant and irrelevant.

Mr. Hayes—My object in asking the question is this: that it might be necessary to ask those questions to the committee here—that is, provided the committee would take further testimony. I was not aware that the committee would take further testimony after having examined the testimony submitted, and it may be important for the committee here to take further testimony after having examined this witness, to take further testimony, and examine these gentlemen here.

The Chairman—I do not deem it material and important, but irrelevant and uncertain, the evidence sought to be elicited. It is mere idle rumor, and I don't propose to keep this committee here to fish up evidence for anybody.

Mr. Hayes—I did not understand Mr. Gibbes to say that it was mere idle rumor. My question is this: I stated before the committee that there were a number of ballots circulated in San Francisco. They were gotten up and ordered printed in the ward of Wanganheim, now deceased—in the Eighth Ward—and that ballot was a fac simile with the Democratic ticket, with Mr. Wanganheim's name substituted for Paul ——, for Supervisor of the eighth. There were sixteen thousand of those ballots printed and circulated. Upon that ticket my name was spelled "Hales," or "Hayles." I heard that there were several such tickets, and that they refused to count them for me. I paid so little attention to it that I did not visit the other persons. I wish to know if the committee will count those for me, or put them down scattering, or record them for Michael Hales—*l* instead of *y*—or whether it will be necessary to send for witnesses to inform the committee why and wherefore the tickets were printed in that manner?

The Chairman—That is a question to the committee, and not to the witness.

Mr. Wason—Mr. Gibbes, would you have withdrawn from the contest if Hamill had not agreed to vote for Mr. Casserly for United States Senator?

The Chairman—I deem the question unimportant and irrelevant, the motive which induced Mr. Gibbes to withdraw from the contest.

Mr. Gray—Before we retire there is a resolution to be offered, giving the sitting members one man to each room, and also the contestants one man to each room.

The Chairman—During the counting?

Mr. Gray—Yes, sir, during the counting. Now, I would suggest that the contestants be instructed to select their man for each room, and that the sitting members be informed, and that the Chairman be notified of their choice, so that they only will be in the different rooms.

Mr. Cressler—I second the motion.

The motion was adopted.

The Chairman—You are instructed, gentlemen, on the side of the contestants, to select one man to represent the contestants in each room that will be occupied in counting—this room, the Controller's room, and the Attorney General's. You will locate here and in those rooms, your men; but the man that you place here will not be allowed to go into either of the other rooms; and so with the others that you place there, they will be confined to the room where you first place them; and the same rule will apply to the sitting members—select a man for each room.

Mr. Ables—That is, if they desire it.

The Chairman—Yes, sir.

Mr. Gray moved to commence the counting at one o'clock this afternoon, and require all the parties interested to be present at that time.

The motion was seconded and carried.

Mr. Wason—Mr. Chairman, I understand that we can be present ourselves, if we so desire, instead of having a representative?

The Chairman—Certainly; but if you take your place here, you will not be allowed to change during the counting.

Mr. Wason—But, in the event of my taking sick, can I substitute a man in my place?

The Chairman—Yes, sir.

Mr. Delaney presented to the committee some tally lists which he had prepared.

Mr. Gray—I move that the committee do now adjourn, to meet in this room at one o'clock.

An amendment to the motion previously carried was offered, that the Chairman appoint from the clerks the parties to be present in each room as witnesses to the counting.

The amendment was not accepted, and the original motion prevailed.

The committee then adjourned.

REPORT

OF THE

Surveyor General to the Assembly,

IN RELATION TO

SWAMP AND OVERFLOWED LANDS.

T. A. SPRINGER.........STATE PRINTER.

REPORT.

To the honorable Assembly of the State of California:

In compliance with your resolution, under date of January twentieth, eighteen hundred and seventy-four, requiring information of this office concerning surveys of lands returned as swamp and overflowed, which are not shown to be such by the State segregation, or by the United States surveys, I have the honor to submit the following statement, showing the name of the applicant, the number of acres standing in his name, and the total for each county, to wit:

COLUSA COUNTY.

Name.	Acres.
Geo. H. Purkett	480
Gideon Gill	40
S. M. Bishop	920
W. C. Belcher	200
Total	1,640

FRESNO COUNTY.

Name.	Acres.
A. C. Bradford	2,240
James M. Johnson	2,120
Total	4,360

LASSEN COUNTY.

Name.	Acres.
W. H. Crane	400
W. C. Wright	200
Geo. W. Long	600
John H. McNee	20,240
Total	21,440

INYO COUNTY.

Name.	Acres.
Joseph Seely	1,080
Josiah Earl	1,486$\frac{68}{100}$
John A. Lank	320
Total	2,886$\frac{68}{100}$

SOLANO COUNTY.

Name.	Acres.
E. H. Marshall	40
Geo. T. Elliott	40
Total	80

SUTTER COUNTY.

Name.	Acres.
S. J. Stahler	40

SISKIYOU COUNTY.

Name.	Acres.
C. J. Dorris	510
W. H. Bowman	160
A. J. Bryant	80
Milan Stewart	240
J. C. Porter	440
James Quinna	1,300
Jesse D. Carr	16,358
Total	19,088

SHASTA COUNTY.

Name.	Acres.
Benj. S. Start	120
E. P. Littrel	160
A. J. Curtiss	80
Joseph Naudles	160
Total	520

PLUMAS COUNTY.

J. W. Willey	240
Edmund White	440
John J. Hallam	840
W. B. Taylor	5,680
E. H. Gould	1,080
Total	8,280

TEHAMA COUNTY.

Name.	Acres.
G. G. Kimball	200

In addition to the foregoing, certified copies of nineteen affidavits and applications to the County Surveyor of Inyo County, for swamp lands, have been received at this office in the name of Josiah Earl, and three in the names of other parties. These applications do not designate legal subdivisions, but simply say all of the swamp and overflowed lands in certain sections, without giving the area. Upon referring to the United States township plat of the townships mentioned, I found that no swamp lands were shown, but the sections claimed were returned as high land.

Within the past two years a large number of swamp land surveys have been rejected by me, and returned to the proper County Surveyor, for the reason that there was no official evidence of the swampy character of the land embraced, and the same was shown to be high land by the United States maps, as was the case with lands in Sierra and other mountain valleys. When claimants have notified the office that they would demand an investigation before the United States Surveyor General, in order to prove the swampy character of the land, I have allowed their surveys to remain on file.

Very respectfully,

ROBERT GARDNER,
Surveyor General.

REPORT OF SENATE COMMITTEE

ON

Public Buildings and Grounds.

G. H. SPRINGER.........STATE PRINTER.

REPORT.

Mr. President: Your Committee on Public Buildings and Grounds, pursuant to a resolution which passed the Senate January ninth, eighteen hundred and seventy-four, requesting us to visit the State University at Berkeley, and investigate the manner in which the money appropriated at the last session of the Legislature, for building purposes, has been expended, and obtain such other information as may be useful to this Legislature, respectfully report:

The committee convened in San Francisco on the twelfth day of January, eighteen hundred and seventy-four, and entered into a patient, thorough, and impartial investigation of the manner in which the work of construction, and all other matters relating thereto, had been conducted.

Your committee examined and heard the evidence of a large number of witnesses; their testimony was reduced to writing by a shorthand reporter employed for the purpose, and the same is presented and submitted with this report, as the result of their investigation.

The Regents of the University, by a special Act of the Legislature, were empowered to contract for the construction of certain buildings at Berkeley, for University purposes; and, acting under this law, they advertised for plans and specifications for two buildings, designated as the College of Agriculture and the College of Letters. The plans and specifications adopted by the Regents were those of Mr. Farquharson of San Francisco. After advertising, according to law, for bids on the College of Agriculture, the contract was awarded to Mr. Dennis Jourdan, for the sum of two hundred thousand dollars, he being the lowest bidder, and was by him erected in strict accordance with the plans and specifications for the above mentioned sum, and is a building of which the State of California has reason to feel proud.

Up to this time, the Regents did their work faithfully and well, and would be entitled to great praise, were it not that their good acts were more than canceled by an act which, in generosity, we will designate by no harsher term than a gross blunder, viz., the appointment of Dr. Merritt, one of their number, as Chairman of the Building Committee, with full power to remodel the plans of Mr. Farquharson for the College of Letters—to make such change and alterations as to him seemed proper; to build of brick, wood, or stone; to build of all of them, or neither of them; to be the Hiram under whose direction and inspection the Temple was to be erected. There was delegated to him all the powers invested in the entire body.

It must be presumed that the Regents saw some superior qualification in Dr. Merritt when they made him Chairman of the Building Committee with such unlimited powers. They must have believed him to be honest, capable, skilled in architecture, and to have a thorough knowledge of the rules, regulations, and customs governing the letting of contracts; that under his administration every citizen in the State, whose rights came under his consideration, would be treated with respect; that he would not be likely to show favors or affection, ill-will or malice, but would deal honestly and impartially with every one. If all these qualifications, or any considerable portion of them, were expected of Dr. Merritt, the following facts are calculated to shake the confidence of the most confiding. After the plans of Farquharson had been remodeled, by order of Dr. Merritt, the following advertisement appeared in several of the newspapers:

"NOTICE TO BUILDERS.

"The Building Committee of the Board of Regents of the University of California solicit proposals for furnishing materials and constructing the College of Letters building, at Berkeley, Alameda County. Proposals will be received for the several parts of work as follows: For materials and carpenter's work; for materials and plaster work; for materials and brick work; for materials and painter's work."

It will be seen, from the above advertisement, that bids would be received up to twelve o'clock, March thirty-first, and all precedent demanded that on that day, at twelve o'clock, the bids should either be opened in the presence of the bidders or returned to them unopened; if returned, the reasons for so doing should be stated, and if they were to be considered at some future day, the bidders should be so informed, that they could have the privilege of being present. The importance of the faithful observance of this custom must be evident to every one. It protects the bidders against all foul play, by allowing them to withhold their bids until the very moment they are to be considered, and giving no opportunity for their bids to be tampered with. If this custom is violated, one of two things must be charged—ignorance or design.

It is a fact, that the bids were not opened at the time that custom demanded they should be opened, but were retained by Dr. Merritt and were opened by him on the day following.

It is a fact, that long before the bids were opened and the contract let, Dr. Merritt had sent to Puget Sound for the lumber to be used in the building.

Another link in the chain of evidence is, that after the contract had been let to Power & Ough, Dr. Merritt informed the Superintendent, Mr. Duncan, that he (Dr. Merritt) was going to superintend the building himself, and that he did not want him to interfere in any way in the construction of the work. This was a strange proceeding on the part of Merritt, when it is known that Mr. Duncan is an experienced workman, and was receiving two hundred dollars per month from the State, for services as Superintendent of construction.

In the construction of the building, in almost all its details, from foundation to roof, the plans and specifications were deviated from, causing much less work, and much less and inferior materials to be used. The plans and specifications called for a first-class building; the building, as it stands, is not third-class.

The following is the proposal of Power & Ough for the construction of the building:

"OAKLAND, March 31st, 1873.

To the Building Committee of the University of California:

GENTLEMEN: We herewith submit our bid for the construction of the College of Letters at Berkeley, according to plans and specifications made by David Farquharson, architect, for the sum of eighty-three thousand seven hundred and fifty dollars, United States gold coin. If the committee would deem it advisable, we can curtail the expense of the building from eight to ten thousand dollars and give you substantially the same building. The principal difference would be made in hardware, stairs, mill-work, and foundation.

"POWER & OUGH."

Now, the committee did deem it advisable to allow these men, Power & Ough, to curtail the expense of the building eight or ten thousand dollars in hardware, stairs, mill-work, and foundation, and, in addition to this, did allow them to curtail the expense of the building in the following additional items: The specifications call for double floors throughout the building; single floors were put in. The specifications call for four coats of paint and two coats of sand; only three coats of paint were put on and no sand. Specifications call for twenty-six-ounce crystal metal glass in the windows; twenty-one-ounce crystal sheet is put in. Roof was to be covered with IX roofing tin; IC tin was used. Walls and floors were to be deafened by filling in with mortar; this has been omitted entirely; one fifth of the wall studding is left out. Specifications call for one-inch lath; one-and-a-half-inch lath are used. Specifications call for three coats of plaster throughout the entire building; two coats only are put on. Specifications call for all the woodwork in the interior of the building to be of Port Orford cedar, all the panels were to be framed together and finished with three coats of the best varnish; redwood is substituted for cedar, the panels nailed together and painted. The outside walls of the building were to be sheathed with one-and-a-half-inch plank; one-inch boards were substituted. The floors were all to be dressed off smooth and oiled; this was omitted. The specifications called for iron girders for the support of the large rooms; other iron in different parts of the building was also called, the price of which was estimated by Mr. Duncan to be from four thousand dollars to six thousand dollars; this iron was all left out. The omission of the girders has, since the completion of the building, rendered it necessary to employ iron columns in the large rooms for the support of the floors above, and thereby marring the beauty of the rooms and interfering with their usefulness. In every instance the workmanship is much inferior to that called for in the specifications. The plans and specifications having disappeared very mysteriously, we obtained the above facts from witnesses who, having made estimates for the erection of the building, had kept a memorandum of the several items of importance provided for in the specifications; but it will be readily seen that in the absence of the plans and specifications, there must be many omissions and alterations not enumerated; but from those recounted, it is very evident that neither plans, specifications, nor contract have in the smallest degree been adhered to, and from this loose and unlawful procedure on the part of Dr. Merritt, Chairman of the Building Committee, Power & Ough must have profited by at least twenty-five thousand dollars of the State's money. But Power & Ough claim to have done extra work to the amount of fifteen thousand dollars. After a careful estimate of the items charged for by them, we believe that the sum of six thousand dollars would be a fair valuation.

Now, in addition to the eighty-three thousand seven hundred and fifty dollars—the amount of the original contracts—there was paid to Power & Ough three thousand seven hundred dollars, making the whole amount eighty-seven thousand four hundred and fifty dollars. Now, if we add the three thousand seven hundred dollars, the amount overpaid, to the twenty-five thousand dollars saved by omissions and alterations, we can have an idea of the extent of the undue profit made by the contractors.

But if it could be proved that the building, as it stands, is worth every cent it has cost the State, still it is a much inferior building to the one contracted for; and we cannot too severely condemn the violation of an honest custom, in the manner in which the bids for the construction of the building were treated, and the violation of law in the construction of the building itself. We will have to add what may be deemed a very significant fact: that Dr. Merritt was the Building Committee, Superintendent, architect, and the furnisher of all the lumber used in the building, and this, too, in the face of a resolution passed by the Board of Regents, that none of their number should directly or indirectly, be interested in any contract in connection with the University.

THOMAS BECK,
WILLIAM WIRT PENDEGAST,
JOHN McMURRY,
JAMES A. DUFFY,
JOHN BOGGS,
W. T. GARRATT.

For materials and roofers' work, and for plumbers' work.

The committee also solicit proposals for furnishing all materials and labor for the completion of the building in our contract.

Plans and specifications for the building are in the hands of Mr. J. W. Duncan, Superintendent, at Berkeley. Proposals will be received until Monday, the thirty-first day of March, A. D. eighteen hundred and seventy-three, at twelve o'clock, M.

Proposals may be addressed to Building Committee of the Board of Regents, care of President Gilman, Oakland, California. No proposal will be entertained, unless accompanied by a satisfactory certified check for a sum of not less than five per cent of the amount of the bids, as a guarantee that a contract will be entered into for the performance of the work, if the bids be accepted; building to be completed on or before the tenth day of September, eighteen hundred and seventy-three. Twenty-five per cent of the value of the materials, or work performed, to be reserved from all payments made during the progress of the work. All payments to be made by warrants of the State Controller on the State Treasurer.

The Building Committee reserves the right to reject any and all bids.

ANDREW J. MOULDER,
Secretary of the Board of Regents.

STATEMENT

OF

Moneys Paid into the State Treasury

FROM

ESTATES OF DECEASED PERSONS AND ESCHEATED ESTATES.

T. A. SPRINGER.........STATE PRINTER.

REPORT.

OFFICE OF CONTROLLER OF STATE,
SACRAMENTO, January 26th, 1874.

Hon. R. PACHECO,
President of the Senate:

In compliance with a resolution passed by the Senate, January twenty-third, eighteen hundred and seventy-four, requesting a statement of the amount of money paid into the State Treasury from the proceeds of the settlements of the estates of deceased persons, that have escheated to the State, I herewith transmit to the Senate the accompanying report. This is all the information that can be obtained from the books of this office.

I have the honor to be, very respectfully,

JAMES J. GREEN,
Controller of State.

STATEMENT

Of moneys paid into the State Treasury from estates of deceased persons and escheated estates.

Date.	BY WHOM PAID.	Name of deceased.	Amount.
August 2, 1853		W. W. Scott	$4,240 31
March 25, 1854	G. W. Shattuck	George Brock	89 09
December 19, 1854	Los Angeles County	Name not given	1,014 79
April 25, 1854	Treasurer of San Joaquin County	Name not given	24 12
May 5, 1854	Treasurer of Contra Costa County	Name not given	22 31
February 1, 1856	Treasurer of Butte County	Name not given	263 17
July 19, 1856	Treasurer of Butte County	Name not given	1,115 50
May 26, 1857	Treasurer of Stanislaus County	Name not given	8 75
August 25, 1857	Treasurer of Humboldt County	Name not given	57 55
April 21, 1859	Treasurer of Tuolumne County	Name not given	209 10
January 12, 1859	Treasurer of Stanislaus County	Name not given	49 55
January 6, 1859	Treasurer of Sonoma County	Thomas Bates	1,356 32
July 22, 1858	Treasurer of Sonoma County	Peter Zulor, or Zeiler	774 31
December 1, 1858	Treasurer of San Francisco County	I. Davis	10 92
December 1, 1858	Treasurer of San Francisco County	Jacques Puserain	403 14
December 1, 1858	Treasurer of San Francisco County	William Evans	130 86
December 1, 1858	Treasurer of San Francisco County	G. W. Richardson	34 79
December 1, 1858	Treasurer of San Francisco County	F. Schmidt	96 03
December 1, 1858	Treasurer of San Francisco County	P. Maurin	741 92
December 1, 1858	Treasurer of San Francisco County	W. H. Bayard	96
December 1, 1858	Treasurer of San Francisco County	John Bothler	40 00

STATEMENT—Continued.

Date.	BY WHOM PAID.	Name of deceased.	Amount.
December 1, 1858	Treasurer of San Francisco County	Jacob Unger	$ 8 55
December 1, 1858	Treasurer of San Francisco County	C. H. Martin	13 72
December 1, 1858	Treasurer of San Francisco County	John Redmond	8 82
February 4, 1860	Treasurer of Del Norte County	J. M. Vandall	134 83
July 28, 1859	Treasurer of Tulare County	Name not given	32 84
July 21, 1859	Treasurer of Tuolumne County	F. Leutard	76 43
July 21, 1859	Treasurer of Tuolumne County	T. J. Poole	173 79
July 21, 1859	Treasurer of Tuolumne County	Samuel Collins	61 11
October 28, 1859	Treasurer of Tuolumne County	John Carlin	41 40
October 28, 1859	Treasurer of Tuolumne County	A. De Liew	2,256 67
May 20, 1861	Treasurer of Tulare County	Name not given	45 11
November 22, 1860	Treasurer of Calaveras County	Name not given	7 03
May 22, 1862	Treasurer of El Dorado County	Name not given	2 04
November 20, 1861	Treasurer of Tulare County	Name not given	68 87
May 20, 1863	Treasurer of Alameda County	Name not given	75 76
November 24, 1862	Treasurer of Yolo County	Name not given	9 80
May 11, 1864	Treasurer of Humboldt County	Name not given	568 99
May 21, 1864	Treasurer of San Bernardino County	Name not given	226 01
June 23, 1863	Treasurer of Santa Barbara County	D. Peasley	52 00
November 23, 1863	Treasurer of Tehama County	Name not given	30 00
November 11, 1864	Treasurer of San Francisco County	Name not given	224 14
November 15, 1864	Treasurer of Humboldt County	Name not given	1,130 81
November 28, 1865	Treasurer of Humboldt County	Name not given	143 96
December 18, 1865	Treasurer of San Francisco County	Name not given	320 86
January 9, 1866	Treasurer of Sutter County	Name not given	57 40
January 16, 1866	Treasurer of Tulare County	Name not given	150 18
February 5, 1866	James R. Fennel	W. Cullier	600 00
March 6, 1866	Treasurer of Santa Clara County	Name not given	491 40
March 8, 1866	Treasurer of Yolo County	Charles Vaughn	126 83
March 8, 1866	Treasurer of Yolo County	Samuel Fellows	
July 13, 1867	Treasurer of San Diego County	Name not given	3,025 42
October 5, 1867	Treasurer of Yolo County	John Spratt	6 30
January 16, 1868	Treasurer of Shasta County	N. E. Woolcut	1,200 97
July 9, 1868	Treasurer of Shasta County	W. Burbridge	64 02
July 9, 1868	Treasurer of Shasta County	D. Carroll	437 11
July 9, 1868	Treasurer of Lassen County	J. Whitford	75 32
July 23, 1868	J. L. Ord	A. Kutz	349 69
January 9, 1869	Treasurer of Shasta County	W. C. Kingston	385 37
May 17, 1869	Treasurer of Klamath County	Henry Payne	262 38
January 6, 1870	Treasurer of Sutter County	Thomas Welch	20 19
January 6, 1870	Treasurer of Sutter County	W. W. Hageman	
January 6, 1871	Treasurer of Sutter County	Isaiah Williams	195 76
February 8, 1871	Treasurer of San Diego County	F. Johnson	289 59
July 5, 1871	Treasurer of Marin County	Roulorn	45 84
July 11, 1871	Treasurer of Sonoma County	F. H. Nash, or Marr	99 91
July 13, 1871	Treasurer of Yuba County	James Tanner	396 20
January 19, 1872	Treasurer of San Bernardino County	Name not given	96 15
January 19, 1874	Treasurer of Shasta County	Edward Stacy	47 26
January 19, 1874	Treasurer of Shasta County	Robert Hill	145 41
January 19, 1874	Treasurer of Shasta County	Antone Chambyron	372 76
	Total		$25,338 49

PETITION

OF

THE LADIES' BENEVOLENT SOCIETY

OF THE

CITY OF SACRAMENTO.

T. A. SPRINGER.........STATE PRINTER.

PETITION.

To the honorable the Senate and Assembly of the State of California:

The undersigned, President and Secretary of the Ladies' Benevolent Society of the City of Sacramento, respectfully represent and show to your honorable bodies, that the society is organized and composed of those ladies of this city who are willing to devote a part of their time to the relief of women and children in distress.

Its members pay into a common fund certain monthly dues, and meet one day in each week for business, preparing clothing, etc.

No officer or member receives pay, and each, in addition to her monthly dues, gives according to her means.

No one not immediately connected with the society, can know the extent of the field of our labors in alleviating distress among the most helpless classes of our citizens.

Without this aid, sickness, suffering, and even death would ensue.

With it, the helpless mother finds nourishment and clothing for her child, and the infant unfortunate is saved from suffering or death.

The members of our society take pleasure in devoting their time to these acts of charity; but they need additional means not within their reach. The State at large is interested in saving to the public those elements which go to make up its strength.

Acting upon this idea, at the last session of the Legislature, fifteen hundred dollars ($1,500) was given to aid us in our work; every dollar of which was added to our accumulation, and expended in feeding and clothing worthy women and children in temporary need of help.

We pray that your honorable bodies, at the present session, will appropriate six thousand dollars to like purpose, and thus enable us to continue our ministration in a circle enlarged by your bounty.

MRS. A. REDDINGTON,
President.
MRS. B. B. CUTTER,
Vice President.

REPORT

OF

COMMITTEE ON PUBLIC EXPENDITURES

ON

PETITION FROM LADIES' BENEVOLENT SOCIETY OF SACRAMENTO.

REPORT.

Senate Chamber, Sacramento, February 7th, 1874.

Mr. President: The Committee on Public Expenditures, to whom was referred the petition of the Ladies' Benevolent Society of the City of Sacramento, "asking for State aid," having given the matter their patient consideration, respectfully submit the following report:

It appears from the petition that the society is a local charity, intended to aid such distressed and helpless women and children as may come within the sphere of its operations. It is a purely private, voluntary association, in no respect founded or governed by the State. It further appears from the petition that the society received from the State, by virtue of an Act of the last Legislature, the sum of fifteen hundred dollars; and it now asks this Legislature to appropriate to its use the sum of six thousand dollars. It will be thus perceived that the wants of this society are fearfully rapid in their increase.

In the opinion of your committee, the Legislature should make no appropriation of money in aid of this or any other society of like kind. The reasons, in our judgment, are numerous, sound, and cogent. Among them we may be permitted to state the following:

First—Charity, like mercy, should not be constrained; but all its gifts should be free, and the hand that earns should be the hand that gives; whereas, if the Legislature gives away the money in the public treasury for purposes of this kind, all these principles are violated. The citizens who contribute the money are forced supporters of these charities, and are not allowed to say to whom or in what quantities their moneys are to be distributed. Those who do not earn the money are the ones that give, and get the credit of the giving. It is poor charity for the members of the Legislature to give away that which they never earned. The servants thus become dictators to their masters.

Second—Societies and associations of this kind are founded on the principle of Christian charity and benevolence, and derive their just claim to support and respect, from their endeavors to influence men and women having the ability, to aid and assist the helpless and distressed. But whenever they derive support from the public treasury they fail to carry out the principles of their foundation, and become simply the distributors of the money wrung by the power of the State from the poor and needy, as well as from the rich. They cease to evoke a spirit of charity and benevolence, by leading those able to give to the helpless and distressed, to expect the State to do what they alone should accomplish.

Third—All the money in the public treasury, and under the control of the Legislature, has been gathered in at great expense, from the poor as well as the rich, from taxes imposed on churches and eleemosynary institutions scattered all over the land. Every dollar thus gathered in has lessened the ability of the taxed to do deeds of charity, and assist the needy of their own neighborhoods, and it is wrong and unjust for the State to distribute the funds thus obtained, to a few influential institutions in the great cities, or near the seat of State government; for by such a course the State becomes a favorer of special charities, to the neglect of others equally worthy, but less influential. There are poor and needy in every neighborhood, town, and village in the State; they and their churches (the monuments of individual charities) are taxed, and that, too, (if the Legislature is to act as prayed for in the petition before us), not for the support of government alone, but that the Legislature may grant aid to such favored societies as it may wish to prosper. Let the State only collect such revenues as it needs for the purposes of government, leaving charity where it belongs, to the Christian and benevolent men and women, scattered all over the State; that they may assist those who are needy in their own neighborhoods, towns, and cities, and who better know the scattered objects of charity than the Legislature setting in the Capitol.

Fourth—All taxation is the taking of private property, and under our Constitution it can only be done for public use. The Legislature could not impose a tax on the State at large to support a private charity, and if it could not tax for that purpose, cannot rightfully divert a tax levied and collected for public use to a private purpose. Can it be said that the Legislature can rightfully tax the citizens of San Diego to support a private charity of Sacramento or San Francisco? We say, no! And if it cannot tax for that purpose, by what right can it divert from the treasury money raised by general taxation to such a purpose? Again, it cannot be that the people, when they formed our State government, intended to create a government with costly machinery, to enforce charity. They never intended to have money collected from them at great cost and expense, and then pay the Legislature some two thousand dollars per day to give it away, when they could give all the money away they pleased without cost or compulsion.

Fifth—There is another controlling and overshadowing reason in this matter why the prayer of the petitioners should not be granted, or any other of like character. By the Constitution of the State, all property must be taxed at its value: the widow's mite, and the orphan's crust; the poor man's hut, and the rich man's mansion. This is a rule founded in justice and based on reason, if taxation is intended only to supply the Government with the necessary means for its support; but if taxation is intended to raise money to be given away in charity, or upon the caprice of the Legislature, the rule has neither reason nor justice to support it. The citizen, by the first rule, as to the use to be made of taxes, has no just ground of complaint, for he is taxed in proportion to not only his ability to pay, but to the protection he receives. If he be poor, and has little property to protect, he pays a small tax; and if he have no property, he receives personal protection from the State, and he pays on his head. But, if we take the other rule, that the citizen can be taxed to support these private charities (and that without his consent), he can justly complain. The poor man is hereby denied the right to do such charity as to him shall seem just. The rich man, who has enough and to spare, does not feel this so severely; but it is none the less an outrage on him. If the framers of our Constitution had intended to raise money by taxation to assist private charities, they would evidently have made a provision allowing the poor an exemption from taxes for charities, and let that burden fall on those able to stand a tax beyond protection. In about every county in the State, the people, independent of their private charities, tax themselves extra to support their poor and infirm. This is enough. An argument we have heard used in favor of these donations is, that a great many persons who receive the benefit of such institutions are persons of education and refinement, and cannot go to a County Poorhouse, or the like; but such persons forget that the poor from whom a great part of these donations is drawn by means of taxation, must go to the Poorhouse when their means fail. It is very questionable if society, even by a constitutional provision, could levy or collect a tax to support private charities, because Governments are not instituted for such purposes, but simply to protect life, liberty, and property; or, in other words, to secure every citizen the right to acquire, have, hold, and enjoy his own as he may choose, so long as he does not injure his neighbor.

We therefore recommend that the Legislature refuse, not only the aid prayed for in this petition, but all others of like character.

LAINE, Chairman.

REPORT OF A MAJORITY

OF

BORDER COUNTY DELEGATIONS, ON JOINT RESOLUTION OF LEGISLATURE OF NEVADA, ASKING THE CESSION OF TERRITORY EAST OF THE SUMMIT OF THE SIERRA NEVADAS.

Supplemental Report of Border Delegations.

MINORITY REPORT OF COMMITTEE

ON

COMMERCE AND NAVIGATION,

ON

SENATE BILL No. 313,

TO IMPROVE THE NAVIGATION OF THE SACRAMENTO
AND SAN JOAQUIN RIVERS.

G. H. SPRINGER.........STATE PRINTER.

REPORT.

Mr. **President**: The Committee on Commerce and Navigation, to whom was referred Senate Bill No. 313, to improve the navigation of the Sacramento and San Joaquin Rivers, introduced by Mr. Roach, have had the same under consideration, as also a substitute presented therefor by the author of the bill, to meet the views of the representatives of Sacramento and San Joaquin Counties, and, in view of the appropriation the measure would require during the ensuing two years, the majority recommend that the bill do not pass.

The minority of the committee beg leave to present to the Senate their views in favor of the bill:

The debris which has settled in the rivers referred to in the bill, has been accumulating in their channels during the last twenty-three years, so as to shoal them in many places, and impede navigation and endanger property and stock along their banks by the imminency of an overflow, which may occur in any season from a heavy rainfall. Such a calamity has happened on more than one occasion in the section of the State of which the Sacramento and San Joaquin Rivers are the discharging channels. The overflows of eighteen hundred and sixty-one and eighteen hundred and sixty-two caused an immense loss of property in that period by the inundation at Stockton and Sacramento, and it devastated an area of territory so great that the losses which ensued were far greater than the amount that would have sufficed at an earlier period to have averted the calamity by deepening the river channels. In addition to the loss in money value, there should be considered the unhealthfulness of the localities, produced by the overflow, and the retardation of settlement caused by the apprehensions of a future inundation.

The immediate influence of the overflow of eighteen hundred and sixty-two was to insure the erection of levees to protect the cities against future danger from a similar cause, and to expend large sums of money in protecting the swamp and overflowed lands reclaimed for cultivation, by adopting a costly levee system. Since the latter means of protection have been adopted, the settlers along the river banks have been frequently kept in a state of alarm from the danger arising from the shoaling of the river beds, and the pressure of their rushing waters against their levees.

Experience has demonstrated that the rising of the rivers by the debris constantly depositing in their channels, must require the levees to be raised higher and higher, while the navigation of the streams, which should promote commerce and navigation, is constantly becoming impaired by obstructions. The proper remedy to secure two objects of great importance, is to dredge the rivers so as to remove the bars and obstructions that form in certain places, then the current, moving with greater rapidity, will gradually deepen the channel, and in time amply repay any outlay made for these purposes, by cheapening transportation.

In eighteen hundred and forty-nine, the Sacramento and San Joaquin possessed a depth of water in their channels which permitted seagoing vessels to anchor at the wharves of Stockton and Sacramento. These streams, as we may now call them, have shoaled so much, owing to artificial causes, that vessels of only light draft can ascend them to the cities which are the natural shipping points of the great valleys of which they are the commercial centers. Ten years of neglect have rendered these great natural highways of transportation comparatively useless for even second-class steamers, and the upper branches of these rivers, which gave cheap water carriage to Marysville or Tehama, and to thriving towns on the upper San Joaquin, are perceptibly diminishing in volume, so as to cause grave apprehensions that in another decade, if their shoaling be not arrested by a proper system of improvement, they will cease to be useful to our people as highways of commerce.

THE FEDERAL GOVERNMENT.

It is the duty of the Federal Government to appropriate moneys for the improvement of the navigable rivers of our State, and any reasonable amount expended for that purpose, would form but a small percentage on the vast sums which are drawn from our people by Federal taxation. In the year just passed, the duties collected on imported goods entered at the San Francisco Custom House, amount to ten and one quarter millions in gold coin, and the internal revenue, for the same period, was nearly two and a half millions in currency. This is a tax on every man, woman, and child within our limits—estimating our population at six hundred thousand—of one twenty dollars per capita, which is two and a half times greater than the average of the Union. The General Government, notwithstanding its obligation to make appropriations to prevent our rivers from shoaling, has done nothing in that behalf; and it is almost a certainty, judging by the past, that no assistance will be extended to us from Washington. Under these circumstances, the State must do something to prevent the shoaling of her rivers, and to demand, when the work shall have been accomplished, reimbursement from Congress. Such a claim would not be long delayed if the work were performed in a proper manner and at a reasonable sum, for engineers would justify the State in doing the work, from the urgent necessity which exists for it. A people who, within a period of less than twenty-five years, have suffered great losses by floods and inundations, and who are taxpayers to the Federal Government to the extent we have set forth in this report, have a just claim to consideration, when they ask that the General Government shall prevent the navigable streams of the State from overflow, by making a reasonable expenditure to deepen their channels.

STATE AID.

If, however, there be no expectations of receiving any return from Congress, for moneys expended by the State to improve the rivers of California, the work should be undertaken with as little delay as possible, as a matter of State policy. Prior to eighteen hundred and sixty-nine, the transportation of our merchandise was made principally by water carriage, and the steamship company engaged in transportation expended considerable sums to deepen the river beds, that their vessels might ply with speed and safety on their waters. Since the organization of the railway system, the rivers have been allowed to shoal, and even recently, although the waters were high in the Sacramento, there were places at which very light draft vessels grounded. The absolute neglect of the State to improve the rivers by removing the debris which had accumulated during the past twenty years, is in marked contrast to her policy in aiding the establishment of a railway system. That does not speak well for our financial sagacity. Had the State, at any time since eighteen hundred and sixty-two—the period of the great overflow, caused by the shoaling of the Sacramento and the San Joaquin Rivers—issued bonds to the amount of one million for their improvement from the Straits of Carquinez to the upper branches of the Sacramento and San Joaquin, we would now have one of the finest river systems of any region of the earth, and engineering talent could have adapted the whole into a system to promote irrigation, reclamation, and navigation. The work that has been left unaccomplished by us will be carried out, it is to be hoped, by wiser people. The interest on the sums given by the State and the river counties to aid railways, would have given increased value to a greater extent of territory, if devoted to river improvements, than what has been accomplished by the vexed question of subsidizing private corporations. In the former case, the highways would belong to the people, and there would be a competition that would do much to prevent railway extortion, and render unnecessary any legislation on the subject. What should be done in this matter, is pointed out by our position as legislators of the State. Many of us came here in early times, and can look back and review, in our memories, what we then beheld.

Two noble rivers flow from the mountains to the sea; vessels that doubled Cape Horn ascended then to the nascent Towns of Sacramento and Stockton. We can now see these rivers from the windows of the Capitol, and can note their sluggish streams bearing but light draft vessels on their waters. We can look ahead, and our judgment will tell us that the time is not far distant when, if their improvement be longer deferred, they will be useless as highways of transportation. Shall we deserve the title of pioneers, if we allow such a calamity to befall our State, from the fear of making a small appropriation?

THE GRAIN CROP.

Unless we can obtain cheap transportation for our surplus grain, we may possibly lose the supplying of the European markets. We are so distant from them by the route around Cape Horn that our freights must rule much higher than those which prevail from the Black Sea ports to Great Britain. During the last season freights frequently reached five pounds sterling per ton. In addition to that item of cost to a foreign market, a commercial prejudice requires our grain to be sacked; our producers are, therefore, subjected to two expenses which do not fall upon the grain producers who ship through the Atlantic ports. The production of Russia is rapidly increasing since the great international Fairs which have been held in European cities. The exhibition made of

American agricultural implements caused a large demand for those labor-saving machines, and in Germany, France, and Southern Russia, thousands, of the most improved patterns, are being used.

The shipment of grain from Odessa and ports of the Black Sea requires for its movement over five thousand vessels. They are light of tonnage, suited to meet the prevailing winds of the Mediterranean. Frequently fleets of these lie becalmed off the Rocks of Gibralter, waiting for a wind, the absence of which does much to delay their voyage. It is not to be expected, however, that in the present advanced state of commercial knowledge, and under the pressure of an active competition, that the towing of those vessels through the straits will long be neglected.

The high cost of transportation from California to European ports may deprive us of the chance of selling our surplus. The Federal Government has become impressed with the necessity of finding a shorter route to the old continent than by the way of Cape Horn, in either direction. For the purpose of discovering a practicable route across this continent, our Government has for the last ten years expended large sums of money, and from the best data obtained, it is probable that Tehuantepec or Nicaragua may be selected. The former, running through Mexico, has the most probabilities of being undertaken. When such a work shall have been accomplished, the vessels that will in future be required for grain transportation will not be the deep sea-going vessels now required to double Cape Horn. The consequence is, that lighter draft vessels, suitable for passing through the Isthmus canal, will be constructed. Such vessels could ascend the deepened channels of our rivers to receive cargo at different shipping points upon their banks, or to discharge it at the place which, from their business relations, would be the marts of their respective districts.

A sea-going vessel will gladly ascend a fresh water stream if there be a depth of water sufficient to float her, for in doing so, be she of wood or iron, her bottom will become so scoured that the barnacles and weeds which accumulate in salt water would disappear, and a few days lying in a fresh stream, thus cleansing her, would save nearly a month's voyage in a trip from San Francisco to European ports. Vessels discharging come into the wharves of San Francisco at high water, and at its ebb are always aground, and suffer no damage by remaining in the soft mud, which would also be the case with vessels ascending a river at high water and grounding on the river bottom. An examination of the map of our State will show what an immense area of cultivable land would find its natural shipping point at Sacramento. A further examination will show that Stockton is the natural outlet of a territory of nearly twenty-five thousand square miles, and that it would be useless to think of weighing in the balance the small amount required for the improvement of rivers which would convey the produce raised in such a territory cheaply to market.

The minority of the committee have discussed the subject at length, for the purpose of inviting the attention of the people of this State to the necessity that exists for river improvement. The history of nations may be searched in vain without finding a civilized State neglecting to maintain, in navigable order, her great rivers. During the past twenty years the western and southwestern States expended immense sums of money to provide a railway system, and they allowed their navigable streams to become impaired. At the last session of Congress the subject was thoroughly investigated, and many States petitioned Congress to grant them aid to improve their natural advantages for water transportation—and these requests were made by States having a thorough system of railway intercommunication. So great was the demand for appropriations for river improvement, that it was evident that no State could receive assistance from the Federal Government in that behalf for years to come. Convinced, as we are, that such will be the case with California now, and for several years hence, the minority of the committee earnestly recommend the State to do something for itself, believing that when the work shall have been accomplished, the financial condition of the Union may be such as to enable Congress to refund all our outlay made for said purposes.

THE OPINION OF THE PRESS.

The bill has been freely criticized by the press of the State, and the amendments suggested from any source have been accepted by the committee. The journals making suggestions are the Sacramento *Record*, *Bee*, *Placer Herald*, *Mountain Democrat*, *Colusa Sun*, Stockton *Independent*, San Francisco *Examiner*, etc. The machine, by the agency of which the dredging of the channels is proposed to be accomplished, has been tried on the Mississippi in deepening the outlets at the mouths of that river. The parties who propose to undertake the work are well known citizens of the State. They are convinced of their ability to do the work to the satisfaction of the people of the State, and desire to engage in the enterprise for a very small compensation, so as to demonstrate the practicability of deepening the channels of the upper branches of the main rivers.

The price appears to be reasonable for the work proposed to be done on the Sacramento. One of the committee, who has had a very extensive experience on that river, Senator Duffy, from his knowledge of the amounts expended during his long connection with the California Steam Navigation Company, thinks that the sum asked for the Sacramento River is too low. But the dredging company are satisfied to enter into bids for the completion of this contract to the satisfaction of the Board of Engineers, designated in the bill.

As regards the work proposed on the San Joaquin River, a delegation from the Board of Trade of Stockton, consisting of Major Orr, editor of the *Independent*, and Messrs. Dorrand, Peters, Kallisher, and Mosely, prefer it shall be done by the cubic yard, and they have fixed the price therefor at the lowest rate at which that work has ever been done by contract in the older States. Should the discussion of the bill suggest any further amendments to safeguard the interests of the people, they will be cheerfully accepted by the company proposing to do the work. If, after the consideration of the project, your honorable body reaches the conclusion that the financial condition of the State will not permit an appropriation to deepen both rivers at this session, the friends of the improvement earnestly hope that an appropriation may be made to deepen one of the rivers mentioned in the bill, for when it is demonstrated by actual trial how much may be accomplished at a comparatively trifling outlay towards river improvement, the next Legislature will undoubtedly continue the good work.

ROACH, Chairman,
DUFFY,
EVANS.

REPORT

OF THE

COMMISSIONERS OF FISHERIES

OF THE

STATE OF CALIFORNIA,

For the Years 1872 and 1873.

1—E

G. H. SPRINGER.........STATE PRINTER.

REPORT.

To His Excellency,
NEWTON BOOTH,
Governor of California:

The Commissioners of Fisheries for the State of California, appointed under an Act of the Legislature entitled "An Act to provide for the restoration and preservation of fish in the waters of this State," approved April second, eighteen hundred and seventy, respectfully submit their second biennial report.

REPORT.

Your Commissioners, in pursuance of the plan contemplated in their last report, proceeded to open correspondence with the most noted fish culturists in the East, and also with the United States Fish Commissioner, at Washington City, upon the subject of obtaining an additional supply of shad, and also a large variety of other food fishes, from the Eastern lakes and sea coast.

By the kindness of the United States Commissioner of Fisheries, the Hon. Spencer F. Baird, we were allowed to avail ourselves of the services of Mr. Livingstone Stone, attached to the United States Commission, and engaged in transferring salmon eggs from California to the waters flowing into the Atlantic. Mr. Stone's high reputation as a successful breeder of fish, as well as a writer upon the subject of pisciculture, not only gave us confidence in the success of the enterprise, but also led us to enlarge and amplify the scope and range of the undertaking.

In this view, we made arrangements with Mr. Stone, for him to proceed to the Eastern States, and there collect a supply of shad, eels, black bass, white fish, tautogs, striped bass, blue fish, and lobsters.

To carry into effect these plans, we chartered from the Central Pacific Railroad Company a special car, to be placed at our disposal at a given point at the East, and there to await the necessary time for being fitted up for the purpose, and to receive its freight of living fish. All the requisite arrangements for the transit of this car over the different lines of roads, as well as for its necessary stoppages and delays at different points where fish were to be taken in, had been most completely made by our colleague, Mr. B. B. Redding, through the agency of the different railroad managers; and, on the seventeenth day of March, eighteen hundred and seventy-three, Mr. Stone left San Francisco, to carry out, if possible, the plan of your Commissioners, to transport a carload of living fish from the Atlantic to the Pacific Ocean.

Referring to this expedition, Mr. Stone says:

"In accordance with instructions received from the Fish Commissioners of the State of California, I left San Francisco for the Eastern coast, on the seventeenth day of March, eighteen hundred and seventy-three, for the purpose of procuring a stock of the best varieties of Eastern fish, and transporting them, alive, across the continent, with a view to introducing these varieties into the public waters of California.

"My plan of operations for the whole undertaking was: First—To collect the fish at some favorable point at the East, where they could be kept alive until everything was ready for the journey. Second—To fit up a car with the apparatus most suitable for transporting living fish; and, third—To take this car, when loaded, to California, in the least possible time, and without any transfer of its contents. This plan was successfully carried into practice, up to the time of the accident just beyond Omaha.

"The first installment of living fish intended for the California car, arrived at Charlestown, New Hampshire—the point of rendezvous—on the seventh of May. It consisted of eighty-two black bass (*grystes fasciatus*), glass-eyed perch (*lucio perca*), and bullheads (*pimelodus*), and about three hundred thousand eggs of the *perca flavescens* and the *lucio perca*.

"These fish were collected at Lake Champlain, and at the Missisquoi River, in Vermont, and were taken a journey of thirty hours, by rail, before reaching Charlestown. They, nevertheless, bore their trip admirably, and arrived at their destination in first-rate order.

"The next two weeks were spent in fitting up the car, which had arrived at Charlestown, New Hampshire, and making other preparations for the difficult undertaking in prospect. Arrangements had been previously made, at the suggestion of the Hon. Spencer F. Baird, United States Commissioner of Fisheries, with Mr. Myron Green, at Castleton, on the Hudson, for a supply of young shad and fresh water eels; and, also, with Captain Orinal Edwards, of Woods Hole, Massachusetts, for young lobsters, and other salt water fish. The Eastern trout (*salmo fontinalis*), were to be taken from the Cold Spring Trout Ponds, at Charlestown. The large lobsters were to come from Johnson & Loring's establishment, at Boston, and Mr. Myron Green was dispatched to the Raritan River for catfish.

"The equipment of the car having been completed, and everything being ready, the third day of June, eighteen hunered and seventy-three, was set for our departure. At midnight of June second, Mr. W. S. Perrin arrived from Boston with a special car, having on board the lobsters, oysters, small lobsters, salt water eels, tautogs, and reserves of ocean water. We began at daylight the next morning filling the tanks in the car and loading in the fish, and by one o'clock in the afternoon everything was ready, and at a quarter past two, on Tuesday, June third, the California Aquarium Car started on its journey.

"The car was furnished by the Central Pacific Railroad Company, and was one of their fruit cars, intended for quick trips across the continent. It was twenty-seven feet long and eight feet wide, and was provided with a Westinghouse air brake and Miller platform, which enabled us to take it along with passenger trains.

"At one end of the car was a stationary tank, built of two-inch plank, lined with zinc, and occupying the whole width of the car, and eight feet of its length.

"This tank was two feet and eight inches deep, and held, when full, about ten thousand pounds of water.

"At the other end of the car was a large ice box, the reserves of sea water, six large cases of lobsters, and a barrel of oysters.

"In the center of the car, and occupying nearly all the room in it, were the other portable tanks for carrying the fish. Our beds were on the top of the large stationary tank, which, of course, was covered. The large tank was also arranged so that we could take on water on a large scale from the waterworks at the railroad stations en route. This proved to be a very great convenience, and was, in fact, indispensable.

"When we left Charlestown, New Hampshire, the car contained upwards of:

"Sixty black bass from Lake Champlain (*grystes fasciatus*).

"Eleven glass-eyed perch from Lake Champlain (*lucio perca*).

"One hundred and ten yellow perch from Missisquoi River (*perca flavescens*).

"Eighty young yellow perch from Missisquoi River (*perca flavescens*).

"Twelve bullheads (horn pouts), from Missisquoi River (*pimelodus*).

"One hundred and ten catfish from Raritan River (*pimelodus*).

"Twenty tautogs from near Martha's Vineyard (*tautoga Americana*).

"One thousand five hundred salt water eels from Martha's Vineyard (*anguilla*).

"One thousand young trout from Charlestown, New Hampshire (*salmo fontinalis*).

"One hundred and sixty-two lobsters from Massachusetss Bay and Woods Hole.

"One barrel of oysters from Massachusetts Bay.

"Supplies of minnows for feed fish.

"The black bass, bullheads, catfish, and part of the lobsters, were full grown and heavy with spawn.

"Besides the fish above enumerated, I took on at Albany forty thousand fresh water eels from the Hudson, and arranged for twenty thousand shad and shad eggs (*alosa præstabilis*), from the Hudson, to overtake us at Chicago.

"The receptacles for holding the fish consisted of one large stationary tank, eight feet square and two feet eight inches deep.

"One round wooden seventy-gallon tank.

"One round fifty-gallon tank.

"Three round thirty-gallon tanks.

"Three conical-shaped thirty-gallon tanks.

"Six conical ten-gallon tin cans.

"One conical fifteen-gallon tin can.

"Three round nine-gallon tin cans.

"Two thirty-five-gallon casks.

"Six large cases (containing the lobsters).

"The total capacity of the whole, excluding the lobster cases, being about sixteen thousand pounds of water.

"Besides the vessels for holding the fish, the car contained the following articles:

"One large one hundred and twenty-gallon cask, filled with ocean water.

"One sixty-gallon cask, filled with ocean water.

"One large ice box.

"One half barrel of live moss.

"One half barrel of water plants.

"Curd and meal for feed.

"One bushel of salt for killing parasites.

"The aerating apparatus referred to.

"One alcohol stove.

"One set carpenter's tools.

"Two lanterns.

"Two hammocks.

"Two spring beds.

"Two mattresses and pillows.
"Two sets bedclothes.
"One broom.
"One lot green sod.
"Two thermometers.
"Pipes, spouts, and syphons, for taking in and letting off water.
"One long-handled dip net.
"Two short-handled dip nets.
"Movable steps to door of car.
"Sundry barrels, pails, dippers, etc.
"Maps, with stations marked where we knew the water to be good or bad.
"Our trunks, valises, and private baggage.

"When the car left Charlestown there were four of us in it—Mr. W. T. Perrin, of Grantville, Massachusetts, Mr. Myron Green, of Highgate, Vermont, Mr. Edward Osgood, of Charlestown, New Hampshire, and myself. We arrived at Albany at eleven o'clock and thirty minutes P. M., the same evening, all the fish doing well, and the water in the tanks standing at forty-five degrees Fahrenheit. Here we took on the forty thousand eels mentioned above, and half a ton of ice. We also left Mr. Myron Green here to go to the New York Shad Hatching Works, at Castleton, on the Hudson, and get a supply of young shad.

"On my urgent application to the New York Central Railroad authorities, that road took us with their passenger train, which was due to leave Albany at two o'clock and forty minutes A. M., on the same night. We reached Suspension Bridge about noon, and left for Detroit, with a passenger train, on the Great Western Railroad. We took on ice and water at Hamilton, Canada, and reached the boat at Detroit ferry about eleven o'clock P. M. the same day—Wednesday, June fourth—all the fish being in good order, except the lobsters, which were dying in considerable numbers. The ferry boat being just filled, without the aquarium car, they left us east of the river all night, and it being very warm, I spent the rest of the night till daylight looking up ice, of which I at last obtained about a ton and a half.

"Leaving Detroit that morning—Thursday, June fifth—we proceeded directly to Niles, Michigan, with a passenger train, via the Michigan Central Railroad. We had now come all the way with passenger trains, and had we known this beforehand, we need not have lost any time in bringing on the shad; as it was, however, we expected to make slow time on freight trains from Albany to Chicago, and I here arranged to have the shad brought on by express from Albany, two days after we left that point. These two days we had now on our hands, and it was very aggravating to be obliged to lose so much time when time was so precious. There was no help for it, however, and as I thought it would be better to wait part of the time on the road than to spend the whole of the two days in Chicago, I had the car dropped at Niles, Michigan, and we remained there till six o'clock and ten minutes the next morning—Friday, June sixth—when we went on to Chicago, after taking on ice and water, and catching some minnows to feed the large fish with. We entered Chicago about ten o'clock on Friday morning, all the fish doing well, except the lobsters and eels.

"The temperature at which I aimed to keep the different varieties of fish were as follows:

	Fahrenheit.
Catfish	50°
Fresh water eels	45° to 50°
Tautogs	45°
Salt water eels	45°
Black bass	42°
Yellow perch	42°
Bullheads	42°
Glass-eyed perch	42°
Trout	38°
Lobsters	34° to 36°
Oysters	34° to 36°

"From the experience which I have now had, however, I would advise a change with some of the fish, which would make the temperature as follows:

	Fahrenheit.
Catfish	50°
Fresh water eels	50°
Bullheads	48°
Glass-eyed perch	48°
Yellow perch	45° to 48°
Black bass	42° to 45°
Salt water eels	42° to 45°
Tautogs	40°
Trout	36° to 38°
Lobsters	34° to 36°
Oysters	34° to 36°

"Mr. Myron Green rejoined us with the shad the next morning—Saturday, June seventh—and at ten o'clock and fifteen minutes A. M. the same day, after having taken on three tons of ice and three tons of Lake Michigan water, we left Chicago for Omaha, via the Chicago and Northwestern Railroad.

"We took on water again at Cedar Rapids, Iowa, and arrived at Omaha at eleven o'clock, on the morning of Sunday, June eighth. Through the courtesy of Mr. C. B. Havens, the train dispatcher of the Union Pacific Railroad, who detailed an engine to take our car to the ice house at the Union Pacific shops, we were enabled to take on a ton and a half of ice, and about one o'clock we started westward again. We were now on our sixth day out, and everything was promising well. All the dead eels had been removed, and we had twenty thousand or thirty thousand left. The mortality of the lobsters was on the decrease, and we still had over forty alive and in good condition. All the other fish were in splendid order. We had ice and water enough on board to take us, if necessary, to the Sierra Nevada—certainly with what supplies we could get in the Wasatch Mountains, where the water is good. The circumstance of the fish having lived so well up to this time, gave us a good deal of confidence, and we were encouraged to hope that they would continue to do well to the end of their journey.

"After leaving Omaha we stowed away as well as we could the immense amount of ice we had on the car, and having regulated the temperature of all the tanks, and aerated the water all around, we made our tea and were sitting down to dinner, when suddenly there came a terrible crash, and tanks, ice, and everything in the car seemed to strike us in every direction. We were, every one of us, at once wedged in by the heavy weights upon us, so that we could not move or stir. A moment after, the car began to fill rapidly with water, the heavy weights upon us began to loosen, and, in some unaccountable way, we were washed out into the river. Swimming around our car, we climbed up on one end of it, which was still out of water, and looked around to see where we were. We found our car detached from the train, both couplings having parted. The tender was out of sight, and the upper end of our car resting on it. The engine was three fourths under water, and one man in the engine cab crushed to death. Two men were floating down the swift current in a drowning condition, and the balance of the train still stood on the track, with the forward car within a very few inches of the water's edge. The Westinghouse air-brake had saved the train. If we had been without it, the destruction would have been fearful.

"One look was sufficient to show that the contents of the aquarium car were a total loss. No care or labor had been spared in bringing the fish to this point, and now, almost on the verge of success, everything was lost.

"I immediately telegraphed the state of affairs to Mr. S. R. Throckmorton, Chairman of the California Fish Commissioners, and to Honorable Spencer F. Baird, the head of the United States Fish Commission at Washington. I received instructions, by telegraph, the next morning, to return East immediately, with my assistants, and take on a shipment of young shad to California, under the auspices of the United States Fish Commission.

"In pursuance of these instructions, I went East, and having obtained forty thousand young shad from the New York State Hatching Works, at Castleton, on the Hudson, I left Albany a second time, at eleven o'clock and thirty minutes P. M, on the twenty-fifth of June, eighteen hundred and seventy-three, in company with Mr. W. T. Perrin and Mr. Myron Green, my assistants on the aquarium car. We were also accompanied, as far as Omaha, on this trip, by Mr. H. M. Webster, whose experience in carrying live shad was, in this instance, of the greatest value.

"On our arrival at Ogden, Utah, I left five thousand of the shad, in first-rate order, in charge of Mr. Rockwood, Superintendent of Fisheries at Salt Lake City, to be introduced into Great Salt Lake, and continued with the other thirty-five thousand to Sacramento, California, where we arrived at half-past one in the afternoon of the second day of July, the fish appearing in every respect as fresh and lively as when they left the Hudson a week before.

"We deposited them that night, at ten minutes past nine o'clock, in the Sacramento River, just above the railroad bridge, at Tehama, the whole undertaking, from beginning to end, having been a perfect success."

Immediately upon hearing of the loss of the aquarium car, we telegraphed a remittance to Mr. Stone, at Omaha, and directed him to repair at once to the Hudson River, and bring out, while yet in time, all the young shad which his now reduced facilities would permit.

Mr. Stone at once proceeded East, and communicating, by telegram, with Mr. Spencer F. Baird, United States Fish Commissioner, received from him not only prompt attention, but was also furnished by Mr. Baird, for the California Commission, all of the shad which the United States Commission could spare—forty thousand in number—which were immediately sent through to California, at the expense of the United States Fish Commission, under the care of Mr. Stone, free of all charges, for which, and for the many kind and valuable aids extended to us by Mr. Baird, this Commission takes this public opportunity of returning their most grateful thanks.

Upon receiving advice of the approach of this shipment, one of the Commissioners repaired to Sacramento, and there met the incoming car with a fresh supply of water and ice. The little immigrants were found to be all alive and in excellent spirits, and after receiving a fresh supply of ice and water, proceeded on their journey to Tehama, on the Sacramento River, and there, that same night, they were successfully placed in the waters which flow into the Pacific.

In the Spring of eighteen hundred and seventy-two, we opened correspondence with Mr. Seth Green, for an additional supply of shad, but the early Summer and excessive heat of the Eastern States at that time, compelled us to abandon the attempt for the season.

In the meantime, viz., in the Fall of eighteen hundred and seventy-two, we received advice of a shipment, made to us by Mr. Baird, of white fish eggs, and we immediately took measures to hatch them, and place them in the waters of the State.

In view of this, we caused an examination of the different lakes into which they could be placed with the best prospect of success, which resulted in our selecting Clear Lake as affording most of the necessary conditions. Among these conditions is an essential one, namely: that it may be seined without destroying other valuable fish, there being few or no fish in that lake, the destruction of which by seining would be any loss, or which, at any rate, would not be most profitably replaced by the white fish, which can be taken only by seining or trapping. The climate, also, of Clear Lake, seemed to us to be the best within reach, remembering always that the eggs of the white fish are very delicate, and will not bear rough transportation. As it was, in the first attempt all the eggs perished; and in the second effort, although great pains were taken, a very large proportion of the eggs perished on the way.

Having selected what we deemed a proper place, we erected a hatching house, under the charge of Mr. J. G. Woodbury, of whom we take pleasure in speaking as a skillful, careful, intelligent, and economical manager.

Mr. Woodbury conducted the hatching of these eggs with great success, and closed his labors with putting into Clear Lake twenty-five thousand living and healthy young white fish, from which we may reasonably hope to stock all the suitable waters in the State. It may be well to state, that the great object at first is to get the desirable fish here and acclimated in our waters; after that, they may be bred artificially, and distributed to any extent.

It is probable, or at least possible, that ten thousand shad may return to our waters this coming Spring, and forty thousand more in eighteen hundred and seventy-six. If such should be the case, and they are properly protected by legislation, it will be no difficult or costly matter to breed from them a million of young fish, which, in three years more, will stock the entire coast, and give us shad as plenty as we now have smelts. But, to arrive at this, we require some stronger legislation, which will absolutely prevent the taking for food of the new shad as they come in; we require them all for breeding.

If it shall be the pleasure of the Legislature to continue to aid this Commission, it is our intention, this next coming year, to renew our effort to bring across the continent the food fishes of the East, and with the experience which we have had, and the additional knowledge which we have gained, we have hopes of not only repairing our loss of last year, but largely to improve upon that effort. We regret to say that our loss was large. We had embarked in it all the remaining funds of the Commission; but no human foresight could have predicted it, or guarded against it; and we can only say that it is worth all that it has cost to know the fact that an aquarium of living fish, eels, and lobsters, provided with both fresh and salt water, can be brought from the Atlantic to within one day's travel of the Pacific, in good order and in healthy condition.

Since our last report, the Commissioners have given somewhat of their attention to placing in some of the streams and lakes different kinds of native and other fish, although they have not been able to do so much as they would desire to do were the means at their command. There is no cheap way of doing this work; everything pertaining to it requires dispatch and care. We are handling a delicate and perishable material, under circumstances in which the painstaking and expense of the most careful preparations may, in a moment of neglect or accident, be lost entirely. Consequently, we have refrained from any expensive experiments, and confined ourselves to the introduction of food fishes fully known to be profitable in other States, and the dissemination of such domestic fish as can be easily and cheaply transferred from one part of the State to another. In this way, we have, during the past season, placed some ten thousand Lake Tahoe trout in the South Yuba River. Trout from the mountain lakes have been placed in the North Fork of the American River. We have purchased from the breeders of Tahoe trout, also, six thousand trout, which have been placed in Lake Merced. We have also purchased two thousand Eastern red speckled trout (*salmo fontinalis*), which we placed in the North Fork of the American River, near the Summit. Two thousand of the same, and six thousand Tahoe trout, we have placed in the headwaters of Alameda Creek, and two thousand more Eastern speckled trout in San Andreas Reservoir, near this city.

The Commission feels greatly encouraged in its efforts to preserve and increase the fish of California, by the general interest taken by the people in this very interesting subject. On all occasions we have had the most ready aid, and in many cases gratuitous services from those with whom the operations of the Commissioners have brought them in contact, and we would respectfully suggest that we believe that the people are now willing to incur a moderate expenditure in order to have this work continued. This Commission does not believe that any large

appropriation for this purpose is now necessary. Time is required to develop and perfect the successful propagation and preservation of foreign varieties of fish. We have yet a great deal to learn in regard to this subject, and undue haste and lavish expenditure are by no means the most certain way to success. It is now three years since the first attempt to bring shad across the continent was commenced. We now know that some of the shad brought here in eighteen hundred and seventy-one have lived and grown to good size. The shoal of shad are not due in the rivers of California until June, eighteen hundred and seventy-four, but we have had in our hands three specimens, which are, of course, exceptional, and we have heard of two others. The incoming fish will be breeders, and we shall require funds to enable us to establish breeding stations on the Sacramento and San Joaquin Rivers, and, above all, we require proper laws to preserve this season's arrivals. It will be seen by the accompanying statement that the entire expenditure of the Commission since its last report, has been less than six thousand dollars, and during the existence of the Commission—four years—but seven thousand. With this a great deal has been done, and the foundation laid for the accomplishment of much more.

The work is but commenced, and as we have before remarked, time in this business is a more important element than money. The most in importance is the means for preventing the destruction of the fish we already have. The Commission find it almost impossible to prevail upon the people to refrain from destroying fish in the localities where they abound. It seems as if human invention is taxed to its utmost in the desire for wholesale destruction, and the reluctance which men feel to complain of their neighbors, renders it almost impossible to enforce the laws in such cases. If the Legislature should see fit to make an appropriation sufficient to allow the Commissioners to employ, at times, a proper person to look after such violations of the fish laws and see to their enforcement, we think this evil could readily be suppressed, as the people at large show a great interest in having the law enforced, but no one is willing to make himself obnoxious by being an informer. All this would be cured by placing the means of remedy in the hands of the Commission.

The Commission already have the power to do this, and have done it with most hopeful results, so far as their limited means have allowed. It will be necessary, during this session of the Legislature, to have passed a full and comprehensive law relating to all kinds of fishing. In the first place, the whole system of fish-traps, seines, fykes, etc., should be abolished by law. Secondly, the meshes of the nets used should be regulated by law. The time of fishing for salmon should be properly limited. There come from all parts of the State constant complaints of the destruction of fish by sawdust, and the refuse from sawmills, thrown into the streams; and petitions for the enactment of laws to prevent it are now before the Legislature. This Commission will be aided by many citizens interested in these matters, in passing a law covering the piscatory interests of the State, which we hope will be favorably acted upon by the Legislature. The Commissioners have taken pains to ascertain the season of the year during which the taking of salmon should be prohibited by law. We have caused careful observations to be made of the time at which the salmon ascend to the heads of the rivers to spawn, and from all the information we have been able to obtain in that way, and by consulting with persons well qualified to afford advice from the results of practical knowledge of the subject, we would recommend that the taking of salmon be prohibited by law from the first of August to the first of November. It should be observed that the having in possession, or offering for sale of salmon, during the close term so prohibited, should be punished the same as the taking of them.

In conclusion, your Commissioners, with much diffidence, would ask the aid of the Legislature for the means of carrying on the work which they feel they have just commenced. There will be necessary, for the coming season, funds to erect hatching houses at such stations as shall have been discovered as the spawning grounds of the shad, now soon to be expected in our waters. The renewal of our effort to bring fish and lobsters across the continent, so nearly successful last year, is an earnest wish of the Commission. Our work at large remains unfinished at the time that we are best qualified to prosecute it. The amount of appropriation necessary to carry the Commission over to the next session of the Legislature is not large, and, when we consider the object to be attained, we feel that we may safely ask for a moderate sum, without laying a very heavy additional burden upon the people. The money already expended is but a trifle compared with the benefits to be derived from a like expenditure in the immediate future.

When we entered upon the duties of our office, the whole subject of fish breeding had but lately been entertained on this coast. The ground was new, and the field of operations opened to the Commission covered a large extent of country and marked varieties of climate. We have been compelled to educate ourselves to the work in hand, and to move as cautiously and economically as possible. We are willing to admit that we take great interest in the continuance of our operations; we know that we have learned a great deal about fish culture that will be useful to the State. We believe that we are now on the road to success. We are willing to give our time to it, and perhaps it is not amiss for us to make this report the means of saying that, which may not be generally known, our services are without charge of any kind to the State. We have no individual interests to subserve, and we only ask aid from the State in order that we may serve her, and carry out to completion the objects for which this Commission was created.

EXPENDITURES.

At the last session of the Legislature, an appropriation of two thousand dollars was made to aid the Commissioners in prosecuting their work, and, since our last biennial report, we have expended the following amounts:

1873.		
Jan. 25....	Paid for advertising in *Union*..................	$22 75
Jan. 25....	Paid for copying report..................................	59 50
Jan. 27....	Paid Comer & Co., for Tahoe trout for South Yuba..	300 00
March 17.	Paid telegraph..	50
April 19...	Paid expenses of establishing hatching station at Clear Lake, expenses of hatching white fish eggs, and examination of Clear Lake, Blue Lake, and other waters..............................	547 26
May 3......	Paid Acclimatization Society for speckled trout placed in San Andreas Reservoir..................	100 00
May 5......	Paid Acclimatization Society for speckled trout placed in the tributaries of Alameda Creek...	100 00
May 10....	Paid reward for first shad taken...........	50 00
June 3.....	Paid traveling expenses of Commissioners........	44 00
	Paid traveling expenses of R. H. Elam, as Fish Warden, to Santa Cruz..............................	60 00
	Paid Haight & Temple, for legal services.........	50 00
	Paid Bugbee for drawings for fish ladders.........	30 00
	Paid Cleveland for fitting up breeding troughs..	77 28
	Paid T. H. Selby & Co. for lead pipe................	38 09
June 12...	Paid expenses of defending salmon laws...........	48 25
	Paid Acclimatization Society for trout placed in American River..	100 00
July 2.....	Paid expenses of Commissioner to Sacramento to meet shad..	8 75
July 10...	Paid Comer & Frazer for Tahoe trout placed in Lake Merced, six thousand in number..........	120 00
July 14...	Paid J. G. Woodbury for services enforcing the salmon laws...	104 50
	Carried forward..	$1,761 88

Brought forward	$1,761 88
Paid Acclimatization Society for six thousand Tahoe trout, placed in Alameda Creek	120 00
Paid expenses of placing the same	51 50
Paid total expenses of the aquarium car bringing fish, eels, and lobsters from the Atlantic Coast to California*	3,912 18
Total amount expended	$5,845 56

*A part of this amount will be restored by a settlement now pending with the railroad companies.

RECAPITULATION.

Amount of appropriation of eighteen hundred and seventy.	$5,000 00
Amount of appropriation of eighteen hundred and seventy-two	2,000 00
Total	$7,000 00
Expenditures, as per report of eighteen hundred and seventy, and of eighteen hundred and seventy-one	$1,137 22
Expenditures, as per report of eighteen hundred and seventy-two and eighteen hundred and seventy-three	5,845 56
Cash remaining on hand December thirty-first, eighteen hundred and seventy-three	17 22
Total	$7,000 00

All of which is respectfully submitted.

S. R. THROCKMORTON,
B. B. REDDING,
J. D. FARWELL,
Commissioners.

APPENDIX.

COMMISSIONERS ON FISHERIES.

UNITED STATES.	
Professor Spencer F. Baird	Washington, D. C.
MAINE.	
E. M. Stillwell	Bangor.
Henry O. Stanley	Dixfield.
NEW HAMPSHIRE.	
Thomas E. Hatch	Keen.
William W. Fletcher	Concord.
W. A. Sanborn	Wiers.
VERMONT.	
M. C. Edmunds	Weston.
M. Goldsmith	Rutland.
MASSACHUSETTS.	
Theodore Lyman	Brookline.
E. A. Brackett	Winchester.
Asa French	South Braintree.
CONNECTICUT.	
William M. Hudson	Hartford.
Robert G. Pike	Middletown.
James A. Bill	Lyme.
RHODE ISLAND.	
Newton Dexter	Providence.
Alfred A. Reed, Jr.	Providence.
John H. Barden	Scituate.

NEW YORK.

Horatio Seymour	Utica.
Robert B. Roosevelt	New York City.
Edward M. Smith	Rochester.

NEW JERSEY.

R. P. Howell	Woodbury.
J. H. Slack	Bloomsbury.

PENNSYLVANIA.

H. J. Reeder	Easton.
B. L. Hewitt	Holidaysburg.
James Duffy	Marietta.

VIRGINIA.

William B. Ball	Mid Lothian.
Asa Wall	Winchester.

ALABAMA.

Charles S. G. Doster	Montgomery.
Ro. Tyler	Montgomery.
D. R. Hundley	Courtland.

CALIFORNIA.

B. B. Redding	Sacramento.
S. R. Throckmorton	San Francisco.
J. D. Farwell	San Francisco.

MICHIGAN.

Governor J. J. Bagley	Detroit.
George H. Jerome	Niles.
George Clark	Ecorse.

OHIO.

John Hussey	Loveland.
John H. Klippart	Columbus.
Dr. Elisha T. Stirling	Cleaveland.

REPORT

OF

Special Committee on Fish and Game

ON

JOINT RESOLUTIONS OF THE LEGISLATURE OF THE STATE OF NEVADA.

G. H. SPRINGER.........STATE PRINTER.

REPORT.

Mr. Speaker: Your Select Committee on Game and Fish, to whom was referred joint resolutions of the State of Nevada relating to the protection of fish in the Truckee River, as also the petition of citizens of Truckee Valley upon the same subject, have carefully considered the same, and report the following:

That the special cause of grievance complained of—the running of sawdust in the Truckee River—applies not only to that stream, but to many others in our State, and a great diversity of opinion in relation to the deleterious effects thereof seems to prevail. Your committee have given the subject considerable attention, examined carefully the petition in favor of the abolition of the practice, as well as the remonstrance of the mill owners and others against the passage of any bill upon the subject.

The conclusions arrived at are: that while we believe the practice is a bad one and should be discontinued, whenever and as soon as it can be done without inflicting great and irreparable injury upon the manufacturing interests which it so seriously affects, yet we do not think it advisable or judicious to enact any law at the present session.

The mill and manufacturing interests located upon the several streams and rivers of our State are of immense value, and afford employment to thousands of people. Mills upon these rivers and streams seem to have been constructed with the sole purpose, so far as sawdust is concerned, of having the same carried off by the current, as a matter of economy, not for the purpose of interfering with the rights of others or of injuring the water. It does not appear there was any malicious intent in any single instance, consequently the rights of all parties should receive impartial consideration. From the evidence before us, it is certain that large sums of money are invested in these mill and manufacturing establishments, and that a change in the manner of disposing of the sawdust would involve a large expenditure, particularly in the case of those mills operated by water-power. So far as the steam mills are concerned, the change might be effected by a comparatively small outlay of capital.

We cannot entirely ignore the other side of the question. The fish interests of the State are of vital importance to all our people; the rapid depletion of many of the streams has excited great apprehension in the minds of many that we will soon present the anomalous condition of a country with the finest rivers, bays, and streams in the world, destitute of that essential article of food. Public spirited and enterprising men are making great efforts, by the outlay of their private means and sacrifice of their time, to restock and replenish the bays, rivers, and streams with all the varieties known to the world.

These praiseworthy efforts should be, as far as practicable, seconded by such needful legislation as may be demanded. If, then, it can be shown officially, by disinterested and competent authority, that the running of sawdust in streams destroys the ova or spawn of fish, and in consequence tends to the depletion of those streams, it should receive careful attention, and just and wise legislative action. The same remarks are applicable so far as water for irrigating purposes are concerned. If the running of sawdust in streams used for irrigating purposes in the farming sections is deleterious and poisonous to the land, it is a serious evil, and should be remedied. We think this whole subject should receive the careful attention and strict investigation of the Fish Commissioners, and be the subject of an official report to the next Legislature of the State.

We believe that the mill men of the State are reasonable people, and if they can be convinced that the present mode is injurious and detrimental to vital interests of their fellow citizens, they will in time so arrange the mode and manner of disposing of their sawdust as will effectually settle the whole subject.

AMERMAN,
Chairman.

MINORITY REPORT

OF

Joint State Prison Committee

IN RELATION TO THE

ESTABLISHMENT OF A BRANCH PRISON.

T. A. SPRNGER.........STATE PRINTER.

REPORT.

State Capitol, February 26th, 1874.

To the Honorable Senate and Assembly of the State of California:

Mr. President: We have the honor to present our report in relation to the question of the establishment of a Branch State Prison, and the location of the same at or near Folsom.

From our observation and inspection of the prison and prison grounds at San Quentin, and our knowledge obtained by inspection, by common report, by the testimony of physicians and others, of the surroundings—sanitary and otherwise—of the proposed site for a Branch Prison at or near Folsom, we cannot concur with the majority of this committee as to the necessity of a Branch Prison, nor as to the adaptability of Folsom for the site of the same. We, therefore, do not concur in the majority report, and in verification of the same, call attention to the following facts:

We believe that the first question to be determined in the location of any public building should be: Is the climate a healthy one, or is it unhealthy? The proposed location for a Branch Prison, near Folsom, we believe to be unhealthy; that malarial diseases do exist there, and have existed there, to a greater or less extent, since the settlement of the country. This condition of climate, being extremely hot from June till October, together with different types of malarial fevers, ought to be a sufficient reason why a Branch Prison should not be located or built there.

We believe there is no necessity of building a Branch Prison at Folsom—a measure which would incur a far greater expense to the State in erecting the prison buildings there than would be incurred in building a Reformatory at San Quentin. A Branch Prison at Folsom would of necessity have to be built by free labor, while a Reformatory Prison at San Quentin could all be built with prison labor, and the present prison would be used to confine the convicts while building it, thereby saving great expense. With two prisons widely separated, it would require two sets of officers and guards to manage the respective institutions, consequently the cost of management would be greatly increased, if not doubled. But this is not all; the extra expense for transportation of convicts and mileage of officers in charge, would be additionally expensive, from the fact that over one third of the convicts are sent from

San Francisco, which is only twelve miles from San Quentin. There are but three States of the Union that have Branch Prisons, and those are not self-sustaining.

If this Branch Prison was built on the proposed site, near Folsom, and the convicts were employed in the quarries, it would not obviate the present objection raised by the associated mechanics—that prison labor should not compete with free labor. Scarcely any occupation can be adopted without competition from some source, and the stonecutters, quarrymen, masons, and builders, would have just as much cause for complaint hereafter, as the mechanics of San Francisco and throughout the State have at present in the manufacture of furniture, saddlery, shoes, etc., now carried on at San Quentin. We hold that the primary aim of punishment for crime should be the reformation of the prisoner, and that the question of competition with free industry should have little weight in determining the question of prison reform. What we want, and fully indorse, is the establishment of a Reformatory Prison, at San Quentin, in addition to the one already there, to be managed by one set of officers, wherein the convicts will be taught useful occupations to themselves and be remunerative to the State, if possible, and during their confinement undergo a system of reform which will fit them, when discharged from prison, to become useful citizens.

The location and climate of San Quentin, we believe, would answer all the requirements called for in the extending of prison accommodations, and also in the building of a reformatory. The climate is temperate and healthy, and the location central, and accessible to all parts of the State. The record of the number of cases of sickness at the San Quentin Prison will compare favorably with any, and far above most institutions of a similar character in the United States, notwithstanding the great want of more sleeping apartments, which, in great part, must be attributed to a healthy climate.

DAVID GOODALE,
J. J. De HAVEN,
B. F. TUTTLE,
THOMAS J. ABLES,
J. F. COWDERY,
J. D. BYERS.

SPECIAL REPORT

OF THE

Committee on Public Buildings and Grounds

IN REGARD TO THE

CONDITION AND NECESSITIES OF THE NAPA
STATE ASYLUM FOR THE INSANE.

G. H. SPRINGER.........STATE PRINTER.

REPORT.

MR. PRESIDENT: The Committee on Public Buildings and Grounds beg leave to submit the following special report in regard to the condition and necessities of the Napa State Asylum for the Insane:

The committee visited Napa City, the site of the asylum, on the thirty-first day of January, and gave to the building, and also to the methods of business in connection therewith of the Directors, a thorough and careful examination. It gives us pleasure to report that, whatever may be said of other public buildings in process of erection at the expense of the State, this one, at least, is progressing in a most satisfactory manner. The Directors are proceeding with the same care and economy which prudent business men manifest in regard to their own private affairs. The work thus far complete consists of a foundation for the entire building. This foundation is of the best material, and has been laid in a thoroughly substantial and workmanlike manner, and at remarkably small cost. With it we are entirely satisfied. Some idea of its dimensions can be formed from the statement that the foundation wall is only less than a mile in length by two hundred and forty feet.

Contracts have been entered into by the Directors for the entire superstructure, on terms which are satisfactory, both as to the character of the contractors and the amounts of the contract prices. The awards were made by the Directors, after thorough advertisement and a spirited competition, and to the lowest bidders. The Directors have made no changes in their original plans; but they have departed, in some instances and respects, from their first intentions. Some of these departures were made because of absolute necessity, and others upon suggestions sanctioned by the highest authorities, and approved by the latest and best experience.

The necessity for the early completion of this building is so apparent that it only needs to be intimated. The overcrowded condition of the asylum at Stockton is simply a shock to humanity. Some complaint has been made that the work has not been more rapidly pressed. It is sufficient to say, on this score, that the Directors have made every possible effort with the means at their command, from the former appropriation, and have, in several instances, anticipated their receipts from the State by the temporary employment of their private fund, in large amount, and without interest.

We find that the sum of six hundred thousand dollars will be necessary in order to complete the building according to the present plans and under existing contracts. Those plans cannot, in our judgment, be changed or simplified without injury instead of benefit. And we are convinced, as before stated, that the contracts cannot be improved, even if it were possible to annul them. With this additional appropriation, the entire cost of the building, with all its adjuncts, including the purchase of the land and the acquisition and utilization of splendid water privileges, will be paid. And we have no hesitation in reporting that it will then be the cheapest public building in this State.

We therefore recommend the speedy appropriation of the amount.

THOMAS BECK,
WILLIAM WIRT PENDEGAST,
JOHN BOGGS,
JAMES A. DUFFY,
JOHN McMURRY,
WILLIAM T. GARRATT.

PRELIMINARY REPORT

OF THE

Committee on Corporations.

G. H. SPRINGER.........STATE PRINTER.

REPORT.

Mr. President: As the railroad bills, including Assembly Bill No. 2, known as the Freeman Bill, the bill reported from this committee, entitled "An Act prescribing the maximum rates which may be charged for the transportation of passengers and freight on the railroads of this State," and the substitute reported by the committee for Senate Bill No. —, providing for a Board of Transportation Commissioners, have been made the special order for Thursday of the present week, and as it is not probable that we will be able to get our final report on the subject of fares and freights before the Senate prior to that date, we beg to submit a preliminary report, containing some statements necessary to a proper understanding of the bills the Senate will then be called on to adopt or reject.

To any one who has bestowed a moment's thought on the subject, it is wholly unnecessary to state that it is one full of difficulty. It is unnecessary also to state that it is one in which are involved large interests. In recommending that Assembly Bill No. 2 do not pass, the committee believe, at least, that they are acting in the interests of the State. The committee have been to some pains to collect such facts as they could lay their hands on, and have prepared some tabular statements which they think demonstrate that the bill, if it should become a law, would operate very injuriously to the material interests of the State. But it will rest with the Senate to determine whether, after they have examined some of the facts which had weight with the committee, the bill should pass into the statute books as one of the laws of the State.

While the committee could not approve Assembly Bill No. 2, and believed that its passage would prove a public calamity, the majority of them believe that the fares and freight charged by railroads for the transportation of passengers and goods, are proper subjects of legislative control; and while they firmly and unequivocally assert the right of the Legislature to regulate and control the railroads operating within the State, they freely concede the difficulties attending the exercise of this power. It is not necessary to point out either the source or nature of these difficulties at this time. Believing that the Legislature possesses the constitutional power to fix the rates of charges which railroads may impose for the services they render, and that there exists at this time a necessity for the exercise of this power, the majority of the committee agreed on bills which they have presented to the Senate and asked to be passed. That Senators may pass an intelligent judgment on the relative merits of the two bills now before the Senate, having the one common object of regulating railroad fares and freights, the statements in this preliminary report are now made, in advance of our final report, that they may be printed prior to the day set for action on the bills.

The rates for fare are the same in both bills, except for the first sixty-two miles. The Assembly bill adopts four cents per mile as the passenger rate for all distances. The bill reported by this committee adopts six cents per mile for the first thirty miles; five cents per mile for all distances from thirty-six to and including fifty miles; from fifty miles to and including sixty-two miles there is one uniform rate of two dollars and fifty cents. This uniform rate for a distance of twelve miles became necessary in dropping from five cents to four cents per mile, to prevent the charge for a longer distance being less than that for a shorter one. The rate of six cents per mile for thirty miles, and that of five cents per mile for fifty miles, was adopted because of a supposed necessity in the interest of short roads. The committee do not doubt the desirableness of low fares, nor have they any disposition to deprive the people of the advantages of them. But the ability of railroads to furnish low fares does not depend solely on the disposition or will of legislative bodies. If the examination which the committee made of the subject had satisfied them that the short roads running through sparsely settled districts could afford to carry for four cents per mile, they would gladly have adopted that rate for short as well as long distances; in fact, it would have given them much more pleasure to have reported a bill with the rate at three cents, or even two cents a mile, if they could have felt assured that such a report would secure fares to the people at those rates. Now, unfortunately, the legislative disposition, or even will, may not be in all instances an exact measure of the ability of railroads to render cheap service. It may not be amiss to state that the distance of thirty miles at six cents per mile was adopted with special reference to the road between Marysville and Oroville, and the distance of fifty miles with reference to the road between Sacramento and Shingle Springs. Such statements were made before the committee as made it appear extremely probable that if the rate of four cents per mile, conjoined with reduced rates of freight, were adopted, the roads would cease to be operated. Certainly, if the statements made were correct, there would have been no inducement to continue to operate them. The committee supposed that the people interested would, perhaps, prefer to pay these comparatively high rates, rather than have no roads. Other short roads were similarly situated. But because six cents was adopted through a necessity imposed by the condition of several short roads, it does not follow that other roads which are under no such necessity, must charge the six or five cents. The present maximum rate is ten cents per mile, yet there are few, if any places, where it is charged. About the Bay of San Francisco, and between Sacramento and San Francisco, and Stockton and San Francisco, competition has kept charges down to a reasonable figure, and we may reasonably trust to competition to do the same in the future.

Your committee have found freights a much more complex and difficult matter. Nor will Senators find it a very easy matter to institute a comparison between the rates prescribed by the Assembly bill and the bill reported by the committee respectively, and come in all instances to satisfactory conclusions as to the cheapness of their respective rates. This difficulty will arise from the fact that the classification of freight is not the same in both. The Assembly bill adopted one uniform rate for all distances beyond eighty miles, but this is for a class or classes of goods not specifically enumerated, nor so pointed out that it is possible to tell what is embraced. It may be conceded, however, as certain, that grain, and the heavier and more compact articles of merchandise, will fall into it. For bulky articles, however, other rates are established. Articles, two thousand pounds of which measure from fifty to sixty cubic feet, the rate is twenty-five per cent, in addition to the rate for heavy articles; that is, for distances over eighty miles, it is three and three quarter cents per mile; on articles, two thousand pounds of which measure from sixty to seventy cubic feet, the rate is four and a half cents per mile; on articles, two thousand pounds of which measure from seventy to eighty cubic feet, the rate is five cents and a quarter per mile; on all articles, two thousand pounds of which measure eighty cubic feet and over, the rate is six cents per mile. While there is, apparently, but one rate prescribed for distances over eighty miles, there are, in fact, five distinct rates. And what is a fact of very material moment, no one can tell what articles fall into any one of these classes, or what proportion of the business of the country will be done, if the bill becomes a law, at any one of these rates. Certainly, many articles, such as lumber, wood, etc., which ought to be carried at the lowest rates, fall into the highest classes. It is, we believe, a classification wholly new to railroads, and one, the effects of which it would be impossible to predict before trial. Some of its effects, of a most remarkable character, when conjoined with the additional percentage allowed for altitude, will be seen in the tabular statements in this report concerning lumber and wood. While the rate fixed in this bill for distances over eighty miles, is popularly supposed to be but three cents per mile, the average rate of all freight carried, aside from grain, would probably approximate more nearly to four and a half or five cents. Grain, which ought to be carried, for all distances over one hundred miles, at much less than three cents per mile, is allowed the full three cents, no matter how great the distance; other articles are allowed, some three and three quarter cents per mile, some four and a half cents per mile, some five and a quarter cents, and some even six. But the vice of the classification is in this, that the articles least able are liable to have to pay the highest rates, as the result of the method of classification. As for example: dry pine wood, an article the least able to stand a high rate of freight, under the Assembly bill, would be in the six cent to the mile class, the highest rate provided. To what extent this vicious mode of classification would doom articles which ought to be carried at the lowest rates to pay the highest, we cannot say; but the very fact that it does do it, is sufficient to condemn it, without stopping to inquire nicely how many articles it would subject to this injustice.

The bill did not commend itself to your committee for another reason: we were unable to see that it would enable the producers of the State, except those in least need of help, to get their coarse and low-priced products to market at any lower rate than they have heretofore paid. The rates fixed for lumber are more than double those now charged; those for grain, at points over a hundred miles, greatly in advance of present rates. The lumberman is not so much concerned about the freight on the few tons of merchandise he may want, as he is about the freight on the thousands of tons of lumber he is shipping off.

A few additional cents per ton on the latter eats up his profits, destroys the value of his property, and sets him adrift a bankrupt, while as many dollars per ton added to the freight on the merchandise he consumes, would be almost unfelt. To the farmer, also, it is a matter of comparative indifference whether he pays a dollar or two more or less per ton for the merchandise he consumes on his farm; but in a few cents per ton on his crop is involved the momentous question whether his business is a success or a failure—whether his lands are a valuable agricultural heritage, or worthless for such purposes. Any attempted solution of the transportation problem which does not direct its main efforts to procuring lower rates of freight for the coarse or unmanufactured products of the country, ignores the real wants of the State, and must fail.

Another point in which the bill fails: It does not recognize the necessity of providing long distances with low rates. The effects of railroads must be, when operated on correct principles, to destroy the natural monopoly which lands situated near markets have. The utility of railroads is seen most strikingly in their effects in bringing lands remote from the markets of the world in competition with those near such markets.

While it ought not to be asked that freights from points near markets should be placed so high as to produce a surplus revenue, so as to allow products to be carried from remote points at less than the cost of moving them, the remote points ought to be allowed all the advantages transportation by rail naturally gives. It is clear that, other things being equal, the rate per mile at which freight can be carried steadily diminishes with the increase of the distance. The Assembly bill utterly ignores this obvious principle, at all distances beyond eighty miles, and, we think, to the manifest detriment of the public interests.

The bill reported by the committee attempts to steer clear, as far as practicable, of the evils pointed out in the Assembly bill. It adopts two fundamental or base rates, so to speak, from which others are deduced—the merchandise rate and the grain rate. Thus all the articles of freight are separated into two grand classes. For the merchandise class, a higher rate of freight is provided; for the grain class, in which is included lumber, wood, and other low-priced articles—the products of the country—a lower rate is established.

In the bill of the committee, the rate provided for first-class freight is the standard rate, by reference to which the rate for other merchandise is fixed. Thus, all articles designated as second-class freight in the classification given in the bill, are charged at eighty per cent of the rate fixed for first-class freight; articles marked "third-class" are charged at seventy per cent of the rates fixed for first-class; articles marked "fourth-class," with sixty per cent; and articles marked "fifth-class," with fifty-five per cent of the rates fixed for first-class freight. The classification being enacted as a part of the bill, there is not the uncertainty which characterizes the Assembly Bill, as to the rate any article will be charged. We recognize another: The practical operations of the two bills will be seen by an inspection of tabular statements showing the amount chargeable per ton under each, at varying distances.

Statement No. 1 exhibits the present charges per ton for first-class freight by the Central Pacific Company on the Western Pacific and the California and Oregon roads, the sums chargeable under the bill reported by the committee, the sums chargeable under the Assembly bill, and the average of rates prescribed by the Illinois Commissioners for the roads with the lowest grade of freights. The Illinois Commissioners prescribe four rates for merchandise, and the sums given in the annexed statement represent the average of those rates on the class of roads provided with the lowest grade of freights.

Statement No. 1.

NAMES OF STATIONS.	Miles..............	Present charges per ton by the C. P. R. R. Co. to stations named.	Amounts chargeable to stations named under bill of Corporation Committee...........	Amounts chargeable to stations named under the Freeman bill......	Average of tolls prescribed by Illinois Commissioners for Illinois roads, with the lowest freight grade...
To San Francisco, from—					
Oakland	7	$1 20	$1 62	70	$2 38
Brooklyn	9	1 40	1 74	90	2 42
San Leandro	16	2 40	2 16	$1 60	2 60
San Lorenzo	18	2 40	2 28	1 80	2 94
Decoto	27	2 40	2 82	1 80.	3 33
Niles	30	2 40	3 00	1 80	3 45
Sunol	37	3 00	3 21	1 90	3 66
Livermore	48	3 00	3 54	2 00	3 99
Altamont	56	3 00	3 72	2 10	4 23
Midway	64	3 00	3 88	2 24	4 47
Ellis	70	3 20	4 00	2 27	4 64
Lathrop	82	3 20	4 24	2 46	5 01
Stockton	92	3 20	4 44	2 76	5 31
Castle	98	3 40	4 56	2 94	5 49
Acampo	107	3 40	4 74	3 21	5 76
Galt	113	3 60	4 86	3 39	5 94
Elk Grove	124	3 60	5 08	3 72	6 27
Sacramento	140	3 60	5 40	4 20	6 75
American River	143	4 00	5 46	4 29	6 81
Arcade	148	4 40	5 45	4 44	6 93
Antelope	155	4 80	5 70	4 65	7 08
R. Junction	158	5 20	5 76	4 74	7 15
OREGON DIVISION.					
Lincoln	169	5 60	5 98	5 07	7 40
Ewing	173	5 80	6 06	5 19	7 49
Sheridan	176	6 00	6 12	5 28	7 56
Reeds	186	6 00	6 32	5 58	7 78
Marysville	192	6 00	6 44	5 76	7 92
Lomo	199	6 80	6 58	5 97	8 07
Live Oak	208	7 20	6 76	6 24	8 28
Biggs	213	7 60	6 86	6 39	8 39
Nelson	223	8 40	7 06	6 69	8 61
Durham	228	8 80	7 18	6 84	8 73
Chico	236	9 00	7 32	7 08	8 91
Shaws	240	9 60	8 40	7 20	9 00
Nord	243	10 00	8 50	7 29	9 06
Soto	250	11 00	8 75	7 50	9 22
Vina	254	11 60	8 89	7 62	9 29
Tehama	263	13 00	10 52	7 89	9 45
Rawson	270	13 40	10 80	8 10	9 58
Red Bluff	275	14 00	11 00	8 25	9 67
Hooker	285	16 00	12 82	8 55	9 85
Cottonwood	292	16 40	13 14	8 76	9 97
Anderson	299	17 20	13 45	8 97	10 10
Clear Creek	305	17 60	13 72	9 15	10 19
Redding	310	18 00	13 95	9 30	10 26

An inspection of the above statement shows:

First—That the rate prescribed in the Assembly bill is lower than the rate prescribed by the bill reported by this committee; that it is lower, also, than the rates now charged by the company, except at a few stations; and that it is very much lower than the rates fixed by the Illinois Commissioners for the Illinois roads.

Second—That the bill reported by the committee prescribes rates higher than those now charged by the company, at all points from San Francisco to Marysville—a distance of one hundred and ninety-two miles—and at all points beyond, its rates are below those now charged.

Third—That the rates in the committee's bill, at all points from San Francisco to Vina—a distance of two hundred and fifty-four miles—are much below those prescribed by the Illinois Commissioners for the Illinois roads, while for distances greater than two hundred and fifty-four miles, the Illinois rates are under those fixed by the committee.

From an examination of the freight schedules of many roads, as well as from comparing their rates with the rates fixed by the Illinois Commissioners, the committee are satisfied that the Central Pacific Company are carrying freights at extremely low rates now between San Francisco and Sacramento, and intermediate points. If their rates were as low elsewhere, no legislation would be needed to reduce them. These rates are the result, no doubt, of competition on the Sacramento and San Joaquin Rivers. In the regulation of freights this portion of road may be dismissed from consideration, as not requiring legislative control.

Statement No. 2 exhibits the present charges per ton, by the car load, for grain, by the Central Pacific Company, the sums chargeable under the bill reported by the committee, the sums chargeable under the Assembly bill, and the rates prescribed by the Illinois Commissioners for the Illinois roads, having the lowest freight grade.

Statement No. 2.

NAMES OF STATIONS.	Miles.	Present charges per ton, by the car load, for grain, to stations named by C. P. R. R. Co.	Sums chargeable per ton, by the car load, for grain, to stations named under bill of Cor. Committee........	Sums chargeable per ton, under Freeman bill..................	Rates prescribed by Illinois Commissioners for grain, by the car load, on Illinois roads with the lowest freight grades..........
To San Francisco, from—					
San Leandro	16	$1 25	$1 80	$1 60	$1 22
San Lorenzo	18	1 25	1 86	1 80	1 26
Decoto	27	1 25	2 11	1 80	1 44
Niles	30	1 25	2 20	1 80	1 50
Suñol	37	1 80	2 27	1 90	1 63
Livermore	48	2 50	2 38	2 00	1 84
Altamont	56	2 60	2 46	2 10	1 98
Midway	64	2 60	2 54	2 24	2 13
Ellis	70	2 60	2 60	2 27	2 27
Lathrop	82	2 80	2 72	2 46	2 50
Stockton	92	2 50	2 82	2 76	2 69
Castle	98	....	2 88	2 94	2 81
Acampo	107	3 20	2 97	3 21	2 92
Galt	113	3 20	3 03	3 29	2 98
Elk Grove	124	3 40	3 14	3 72	3 08

Statement No. 2—Continued.

NAMES OF STATIONS.	Miles.	Present charges per ton, by the car load, for grain, to stations named by C. P. R. R. Co.	Sums chargeable per ton, by the car load, for grain, to stations named under bill of Cor. Committee........	Sums chargeable per ton, under Freeman bill..................	Rates prescribed by Illinois Commissioners for grain, by the car load, on Illinois roads with the lowest freight rates..........
To San Francisco from—					
Sacramento	140	$3 60	$3 30	$4 20	$3 24
Arcade	148	3 80	3 38	4 44	3 31
Antelope	155	3 80	3 48	4 65	3 38
R. R. Junction	158	3 80	3 55	4 74	3 41
OREGON DIVISION:					
Lincoln	169	4 20	3 80	5 07	3 49
Ewing	173	4 20	3 89	5 19	3 52
Sheridan	176	4 40	3 96	5 28	3 54
Reed's	186	4 40	4 18	5 58	3 62
Marysville	192	4 40	4 32	5 76	3 67
Lomo	199	5 20	4 47	5 79	3 72
Live Oak	218	....	4 68	6 24	3 79
Biggs'	223	5 40	5 01	6 39	3 91
Durham	228	5 80	5 13	6 84	3 95
Chico	236	6 00	5 31	7 08	4 01
Shaw's	240	6 40	5 40	7 20	4 04
Nord	243	6 60	5 46	7 29	4 06
Soto	250	6 80	5 62	7 50	4 12
Vina	254	7 00	5 62	7 62	4 15
Tehama	263	7 00	5 62	7 89	4 22
Rawson	270	7 50	5 62	8 10	4 27
Red Bluff	275	7 50	5 62	8 25	4 31
Hooker	285	....	5 70	8 55	4 38
Cottonwood	292	....	5 84	8 76	4 42
Anderson	299	....	5 98	8 97	4 46
Clear Creek	305	....	6 10	9 15	4 50
Reading	310	....	6 20	9 30	4 52
VISALIA DIVISION:					
Lathrop	82	2 80	2 72	2 46	2 50
Morrano	88	2 80	2 78	2 64	2 62
Stanislaus	93	2 80	2 83	2 79	2 71
Salida	97	2 80	2 87	2 91	2 79
Modesto	102	3 20	2 92	3 06	2 87
Ceres	107	3 40	2 97	3 21	2 92
Keys'	110	3 40	3 00	3 30	2 95
Turlock	115	3 40	3 05	3 45	3 00
Cressey	125	3 40	3 15	3 75	3 09
Arena	128	4 00	3 18	3 84	3 12
Atwater	132	4 00	3 22	3 96	3 16
Merced	139	4 20	3 29	4 17	3 23
Plainsburg	149	4 80	3 39	4 47	3 32
Minturn	156	5 40	3 51	4 68	3 39
Berenda	165	6 00	3 71	4 95	3 46
Borden	175	6 40	3 93	5 25	3 54
Sycamore	184	6 80	4 14	5 52	3 61
Fresno	194	7 00	4 36	5 82	3 68
Fowler	204	7 20	4 59	6 12	3 76
K. River	214	7 40	4 81	6 42	3 84
Goshen	228	....	5 13	6 84	3 95
Tulare	239	7 60	5 37	7 17	4 03
Tipton	249	8 00	5 60	7 47	4 11

A mere inspection of the above statement will suffice to exhibit the effects of the two bills, respectively, so far as this class of freight is concerned.

Statement No. 3 exhibits the present charges of the Central Pacific Company per ton, by the car load, on lumber, the sums chargeable under the bill of the committee, and the sums chargeable under the Assembly bill.

Statement No. 3.

NAMES OF STATIONS.	MILES.	Present charges per ton, by the car load, for lumber, to stations named by the C. P. R. R. Co.	Sums chargeable per ton, by the car load, for lumber, under the bill reported by the Senate Corporation Committee	Sums chargeable per ton, for lumber, under the Freeman bill
To San Francisco, from—				
Auburn	176	$3 20	$3 47	$7 92
Clipper Gap	183	3 80	3 60	8 38
New England Mills	189	3 90	3 74	8 79
Colfax	194	4 00	3 84	9 13
Gold Run	205	4 30	4 06	9 87
Dutch Flat	207	4 30	4 11	10 00
Alta	209	4 30	4 14	10 14
Shady Run	213	4 50	4 22	10 41
Blue Cañon	218	4 50	4 32	10 75
Emigrant Gap	223	4 70	4 42	11 08
Cisco	232	4 80	4 69	11 70
Cascade	239	4 80	4 74	12 16
Summit Valley	242	5 00	4 79	12 37
Truckee	260	5 10	4 95	13 59
Boca	268	5 30	4 95	14 13
State Line	278	5 50	4 95	14 80
To Sacramento, from—				
Auburn	36	1 80	1 99	2 85
Clipper Gap	43	2 40	2 06	3 25
New England Mills	49	2 50	2 11	3 52
Colfax	54	2 50	2 15	3 67
Gold Run	65	2 80	2 25	4 10
Dutch Flat	67	2 80	2 27	4 11
Alta	69	2 80	2 28	4 27
Shady Run	73	3 00	2 32	4 45
Blue Cañon	78	3 00	2 37	4 55
Emigrant Gap	83	3 20	2 41	4 78
Cisco	92	3 30	2 49	5 40
Cascade	99	3 30	2 55	5 87
Summit Valley	102	3 50	2 57	6 07
Truckee	120	3 60	2 73	7 29
Boca	128	3 80	2 80	7 83
State Line	138	4 00	2 89	8 48

Statement No. 3—Continued.

NAMES OF STATIONS.	MILES.	Present charges per ton, by the car load, for lumber, to stations named by the C. P. R. R. Co.	Sums chargeable per ton, by the car load, for lumber, under the bill reported by the Senate Corporation Committee	Sums chargeable per ton, for lumber, under the Freeman bill
To Chico, from—				
Auburn	96	$3 20	$2 52	$4 32
Clipper Gap	103	3 40	2 58	4 78
New England Mills	109	3 50	2 64	5 19
Colfax	114	3 50	2 68	5 53
Gold Run	125	3 80	2 78	6 27
Dutch Flat	127	3 80	2 79	6 40
Alta	129	3 80	2 81	6 54
Shady Run	133	4 00	2 85	6 81
Blue Cañon	138	4 00	2 89	7 15
Emigrant Gap	143	4 20	2 94	7 47
Cisco	152	4 30	3 01	8 10
Cascade	159	4 30	3 16	8 56
Summit Valley	162	4 50	3 21	8 77
Summit	165	4 50	3 27	8 97
Truckee	180	4 60	3 57	9 99
Boca	188	4 80	3 73	10 53
State Line	198	5 00	3 92	11 20
To Merced, from—				
Auburn	169	6 30	3 35	7 60
Clipper Gap	176	6 50	3 49	8 06
New England Mills	182	6 90	3 60	8 47
Colfax	187	6 90	3 71	8 81
Gold Run	198	7 20	3 92	9 55
Dutch Flat	200	7 20	3 96	9 68
Alta	202	7 20	4 01	9 82
Shady Run	205	7 40	4 06	10 03
Blue Cañon	208	7 40	4 12	10 22
Emigrant Gap	213	7 60	4 22	10 57
Cisco	222	7 70	4 40	11 17
Cascade	229	7 70	4 54	11 65
Summit Valley	232	7 90	4 60	11 84
Summit	235	7 90	4 65	12 05
Truckee	250	8 00	4 95	13 06
Boca	258	8 20	4 95	13 60
State Line	268	8 40	4 95	14 27

The enormously high rates allowed by the Assembly bill is due to the double percentage allowed for bulk and altitude. Dry lumber falls into that class of freight, for which there is allowed to be added fifty per cent for bulk; and in the computation of the sums given in the above statement, Auburn was taken as the point at which an increase of rate was allowed for altitude.

Statement No. 4 exhibits the present charges of the Central Pacific Company for wood per ton, by the car load, the sums chargeable under the bill of the committee, and the sums chargeable under the Assembly bill.

Statement No. 4.

NAMES OF STATIONS.	Miles	Present charges per ton, by the car load, for wood, to the stations named, by C. P. R. R. Co.	Sums chargeable by the car load, for wood, to the stations named, under Corporation Committee Bill	Sums chargeable per ton for wood, to the stations named, under Freeman's bill
To Sacramento City, from—				
Auburn	36	$1 60	$1 71	$3 31
Clipper Gap	43	1 70	1 77	3 78
N. E. Mills	49	1 70	1 81	3 95
Colfax	54	1 80	1 85	4 28
Gold Run	65	1 90	1 93	4 84
Dutch Flat	67	2 10	1 95	4 87
Alta	69	2 10	1 97	5 07
Shady Run	73	2 20	1 99	5 25
Blue Cañon	78	2 30	2 04	5 31
Emigrant Gap	83	2 40	2 07	5 58
Cisco	92	2 60	2 14	6 30
Cascade	99	2 90	2 19	6 84
Summit Valley	102	3 00	2 21	7 08
Summit	105	3 00	2 24	7 32
Truckee	120	3 30	2 35	8 50
Boca	128	3 50	2 41	9 13
State Line	138	3 60	2 49	9 91

The double percentage for bulk and altitude operates here, also, under the Assembly bill, as in the case of lumber, to swell the rates to almost fabulous sums. In dry hard-wood, according to the accepted estimates of its weight, there is chargeable for bulk, seventy-five per cent; and on dry soft-wood one hundred per cent.

Statement No. 5 exhibits the present charges of the Central Pacific Company per ton on first-class freight, between the Town of Rocklin and the eastern line of the State, the sums chargeable under the bill of the committee, and the sums chargeable under Assembly bill.

Statement No. 5.

NAMES OF STATIONS.	Miles	Present charge per ton for first-class freight between Rocklin and State line, by C. P. R. R. Co.	Sums chargeable per ton for first-class freight between Rocklin and State line, under Senate Coporation Committee Bill	Sums chargeable per ton for freight from Rocklin to State line, under Freeman's bill
From San Francisco, to—				
Junction	158	$5 20	$5 76	$4 74
Rocklin	162	6 00	5 84	4 86
Pino	165	6 20	5 96	4 95
Penryn	168	6 60	6 08	5 04
Newcastle	171	7 00	6 20	5 13
Auburn	176	7 80	6 40	5 28
Clipper Gap	183	8 80	6 68	5 59
N. E. Mills	189	9 60	6 92	5 80
Colfax	194	10 60	7 12	6 09
C. H. Mill	199	11 20	7 32	6 31
Gold Run	205	12 00	8 68	6 58
Dutch Flat	207	12 40	8 82	6 67
Alta	209	12 60	8 96	6 76
C.-Mill	210	13 00	9 03	6 81
Shady Run	213	13 20	10 56	6 94
China Ranch	215	13 60	10 72	7 03
Blue Cañon	218	14 20	10 96	7 14
Owl Camp	221	14 40	12 60	7 30
Chinns Sdg	222	14 80	12 69	7 35
Emigrant Gap	223	14 80	12 78	7 39
Crystal Lake	230	16 00	13 41	7 71
Cisco	232	16 20	13 59	7 80
Tamarack	235	16 60	13 86	7 93
M. Mills	238	17 20	14 13	8 07
Cascade	239	17 20	14 22	8 11
Patterson	241	17 40	14 40	8 20
Summit Valley	242	17 80	14 49	8 25
Summit	245	18 00	14 76	8 38
Strongs	252	19 20	15 38	8 70
Stanford's	254	19 60	15 57	8 79
Millers	256	19 80	15 75	8 88
Donner Lake	257	19 80	15 84	8 92
Truckee	260	20 40	16 11	9 06
Boca	268	21 60	16 83	9 42
State Line	278	23 20	17 73	9 87

Statement No. 6 exhibits the present charges per ton by the Central Pacific Company on second, third, fourth, and fifth classes of freight, and the sums chargeable for the same class of freight to the same points under the bill reported by the committee.

STATEMENT No. 6.

NAMES OF STATIONS.	Miles.	Present charges per ton to Stations named by C. P. R. R. Company for second class freight	Sums chargeable per ton for second class freight to Stations named under bill of Senate Corporation Com.	Present charges per ton for third class freight to Stations named by C.P.R.R. Company	Sums chargeable per ton for third class freight to Stations named under bill of Senate Corporation Com.	Present charges per car load of ten tons for fourth class freight by C. P. R. R. Company	Sums chargeable per car load of ten tons for fourth class freight under bill of Senate Corporation Com.	Present charges per car load of ten tons for fifth class freight by C. P. R. R. Company	Sums chargeable per car load of ten tons for fifth class freight under bill of Senate Corporation Com.
From San Francisco to—									
Oakland	7	$1 00	$1 29	$1 00	$1 13	$9 00	$9 72	$9 00	$8 91
Brooklyn	9	1 60	1 39	1 00	1 21	9 00	10 44	9 00	9 57
San Leandro	16	1 40	1 72	1 40	1 51	12 00	12 96	12 00	11 88
San Lorenzo	18	1 40	1 82	1 40	1 59	12 00	13 68	12 00	12 54
Decoto	27	1 60	2 25	1 60	1 97	14 00	16 92	14 00	15 51
Niles	30	1 60	2 40	1 60	2 10	14 00	18 00	14 00	16 50
Sunol	37	2 00	2 56	1 80	2 24	16 00	19 26	16 00	17 65
Livermore	48	2 60	2 83	2 20	2 47	18 00	21 24	18 00	18 47
Altamont	56	2 60	2 97	2 20	2 60	19 00	22 39	19 00	20 46
Midway	64	2 60	3 12	2 20	2 71	20 00	23 28	20 00	21 34
Ellis	70	2 80	3 20	2 40	2 80	21 00	24 00	21 00	22 00
Lathrop	82	2 80	3 39	2 40	2 96	22 00	25 44	22 50	23 32
Stockton	92	2 80	3 55	2 40	3 10	23 00	26 64	23 00	24 42
Castle	98	3 00	3 64	2 60	3 19	23 00	27 36	23 00	25 08
Acampo	107	3 00	3 79	2 60	3 31	24 00	28 44	24 00	26 07
Galt	113	3 20	3 88	2 80	3 40	24 00	29 16	24 00	26 73
Elk Grove	124	3 20	4 06	2 80	3 55	24 00	30 48	24 00	27 94
Sacramento	140	3 20	4 32	2 80	3 78	24 00	32 40	24 00	29 70
American River	143	3 60	4 36	3 20	3 82	27 00	32 76	26 00	30 03
Arcade	148	4 00	4 44	3 60	3 89	30 00	33 36	28 00	30 58
Antelope	155	4 40	4 56	4 00	3 99	32 00	34 20	30 00	31 35
R. Junction	158	4 80	4 60	4 40	4 03	34 00	34 56	32 00	31 68
OREGON DIVISION.									
Lincoln	169	5 20	4 78	4 80	4 18	36 00	35 88	34 00	32 89
Ewing Station	173	5 40	4 84	5 00	4 24	38 00	36 36	36 00	33 33
Sheridan	176	5 60	4 89	5 20	4 28	40 00	36 72	38 00	33 66
Reeds	186	5 60	5 05	5 20	4 42	42 00	37 92	40 00	34 76
Marysville	192	5 60	5 15	5 20	4 50	42 00	38 64	40 00	35 42
Lomo	199	6 00	5 26	5 60	4 60	44 00	39 48	42 00	36 19
Live Oak	208	6 40	5 40	6 00	4 73	47 00	40 56	44 00	37 18
Biggs	213	6 80	5 48	6 40	4 80	48 00	41 16	46 00	37 73
Nelson	223	7 20	5 64	6 80	4 94	51 00	42 36	49 00	38 83
Durham	228	7 60	5 74	7 20	5 02	53 00	43 08	50 00	39 49
Chico	236	7 60	5 85	7 20	5 12	55 00	43 92	51 00	40 26
Shaw's	240	8 00	6 72	7 60	6 08	57 00	50 40	53 00	46 20
Nord	243	8 20	6 80	7 60	5 95	58 00	51 00	54 00	46 75
Soto	250	8 80	7 00	8 20	6 12	61 00	52 50	57 00	48 12
Vina	254	9 20	7 11	8 60	6 22	63 00	53 34	59 00	48 89
Tehama	263	9 80	8 41	9 20	7 36	66 00	63 12	62 00	57 86
Rawson	270	10 40	8 64	9 60	7 56	68 00	64 80	64 00	59 40
Red Bluff	275	10 80	8 80	10 00	7 70	71 00	66 00	66 00	60 50
Hooker	285	11 20	10 25	10 40	8 97	76 00	73 92	72 00	70 51
Anderson	299	11 80	10 76	11 00	9 41	79 00	80 70	75 00	73 97
Redding	310	12 20	11 16	11 40	9 76	81 00	83 70	77 00	76 72

Statement 7 exhibits the present charges of the California Pacific Company for first-class freights, the sums chargeable under the committee's bill, computed from San Francisco, and the sums chargeable under Assembly bill.

California Pacific Railroad—Merchandise—Statement No. 7.

NAMES OF STATIONS.	Miles....................	Present charges per ton, for first-class freights, to stations named by the California Pacific Railroad..................	Sums chargeable per ton for first-class freights to stations named under bill of Senate Corp. Committee--estimated from San Francisco....	*Sums chargeable per ton for freights to stations named under Freeman's bill..... ....*
From San Francisco to—				
Napa Junction	31	$1 75	$3 03	$1 80
Creston	35	2 15	3 15	1 90
Bridgeport	39	2 75	3 27	1 90
Fairfield	44	3 00	3 42	2 00
Cannons	50	3 00	3 60	2 00
Vaca	55	4 00	3 70	2 10
Batavia	59	4 20	3 78	2 10
Dixon	63	4 40	3 86	2 20
Foster's	67	4 60	3 94	2 27
Davisville	71	4 80	4 02	2 30
Washington	83	4 80	4 26	2 49
Sacramento	84	4 80	4 28	2 52
Merritt's	76	5 00	4 12	2 28
Woodland	80	5 19	4 20	2 40
Curtis	85	5 25	4 30	2 55
Knights Landing	90	5 35	4 40	2 70

Statement 7½ exhibits the present charges of the California Pacific Company for grain per ton, by the car load, the sums chargeable under the bill of the committee, and the sums chargeable under the Assembly bill.

California Pacific Railroad grain rates—Statement No. 7½.

NAMES OF STATIONS.	Miles....................	Present charges for grain per ton, by the car load, to stations named by the Cal. P. R. R. Co......................	Sums chargeable per ton for grain, by the car load, to stations named under bill of the Senate Committee on Corporations..............	Sums chargeable per ton for grain under Freeman's bill ....
To Vallejo, from—				
Napa Junction	7	$1 00	$1 56	$ 70
Creston	11	1 00	1 67	1 10
Bridgeport	15	1 12	1 78	1 50
Fairfield	20	1 12	1 98	1 60
Cannons	26	1 80	2 09	1 80
Vaca	31	2 00	2 21	1 86
Batavia	35	2 10	2 25	1 90
Dixon	39	2 25	2 29	1 90
Foster's	43	2 40	2 33	2 00
Davisville	47	2 75	2 37	2 00
Washington	59	....	....	....
Sacramento	60	....	....	....
Merritt's	52	2 90	2 42	2 08
Woodland	56	3 00	2 46	2 08
Curtis	61	3 10	2 51	2 13
Knights Landing	66	2 25	2 56	2 27

Statement 8 exhibits the present charges of the San Francisco and Northern Pacific Railroad Company (Donahue's road) for first-class freight, the sums chargeable under the committee's bill, with steamer freights added, the sums chargeable under the Assembly bill, and the sums chargeable for grain per ton by the car load, under committee's bill, with river freights added.

Statement No. 8.

NAMES OF STATIONS.	Miles..........	Present charges per ton for first-class freight, to stations named by S. Francisco and North Pacific Railroad Company.........	Sums chargeable per ton for first-class freight under bill of Committee on Corporations. River freights added to railroad charges.	Sums chargeable per ton for first-class freight to station named, under Freeman Bill	Sums chargeable per ton for grain by the car-load to station named, under bill of Corporation Committee; river freight added.
To San Francisco, from—					
Donahue	34	$1 40	$1 40	$1 90	$1 40
Lakeville..................................	35	1 40	2 50	1 90	2 50
Petaluma	42	1 40	3 08	1 99	2 98
Ely's..................................	45	2 60	3 26	2 00	3 07
Penn's Grove..................................	46	2 60	3 32	2 00	3 09
Goodwin's	47	2 60	3 38	2 00	3 12
Page's..................................	49	2 80	3 50	2 00	3 18
Cotate..................................	52	3 00	3 68	2 08	3 26
Santa Rosa..................................	57	3 40	3 98	2 10	3 40
Fulton..................................	61	4 00	4 22	2 13	3 51
Mark West..................................	63	4 60	4 34	2 20	3 57
Windsor..................................	66	5 00	4 46	2 27	3 62
Grant's..................................	70	5 60	4 58	2 28	3 66
Healdsburg..................................	72	5 60	4 64	2 34	3 68
Haighe's..................................	76	6 40	4 76	2 40	3 72
Geyserville	82	7 60	4 94	2 46	3 78
Truett's..................................	86	8 00	5 04	2 58	3 82
Cloverdale..................................	90	8 40	5 12	2 70	3 86

Statement 9 exhibits the sums chargeable for grain per ton by the car load under bill of the committee, the rates prescribed by the Illinois Commissioners for the Illinois roads having the lowest freight grades, the rates charged by the Central Pacific Company, the rates charged by the Illinois Central Railroad Company, the rates charged by the Peoria and Rock Island Railroad Company, and the rates charged by the Indianapolis, Bloomington, and Western Railway.

Statement No. 9.

Number of miles..........	Sums chargeable per ton for grain, by the car load, under bill of Senate Committee on Corporations..........	Rates prescribed by Illinois Commissioners for grain per ton, by the car load, for roads with the lowest freight grades...	Rates (special) charged on grain per ton, by the car load, by Central Pacific Railroad Company on Western and Oregon Divisions	Rates charged for grain per ton, by the car load, by the Illinois Central Railroad..........	Rates charged per ton on grain, by the car load, by the Peoria and Rock Island Railroad..........	Rates charged per ton on grain, by the car load, by the Indianapolis, Bloomington & Western Railway..........
1	$1 10	$ 94	....	....	$ 25	
2	1 20	96	....	....	44	
3	1 30	98	....	....	62	
4	1 40	1 00	....	....	81	$1 04
5	1 50	1 02	....	....	99	
6	1 53	1 03	....	....	1 07	
7	1 56	1 05	....	$1 88	1 14	
8	1 58	1 07	....	....	1 22	
9	1 61	1 09	....	....	1 30	
10	1 64	1 11	....	....	1 37	1 20
15	1 78	1 21	$1 25	2 08	1 61	
20	1 92	1 30	....	....	1 84	1 50
25	2 06	1 40	....	....	1 96	
30	2 20	1 50	1 25	2 38	2 06	1 80
35	2 25	1 60	1 80	2 48	2 10	1 90
40	2 30	1 69	2 25	2 61	2 14	
45	2 35	1 79	....	....	2 18	2 10
50	2 40	1 89	2 50	....	2 22	2 14
55	2 45	1 98	2 50	2 86	2 26	2 20
60	2 50	2 08	....	....	2 30	2 25
65	2 55	2 18	2 60	2 98	2 34	2 30
70	2 60	2 28	2 60	3 06	2 38	
75	2 65	2 37	2 60	....	2 42	2 38
80	2 70	2 47	2 80	3 26	2 46	2 45
85	2 75	2 56	....	3 30	2 50	2 50
90	2 80	2 66	2 50	3 44	2 54	2 55
95	2 85	2 76	....	....	....	2 60
100	2 90	2 85	....	3 76	....	2 65
105	2 95	2 90	3 05	3 79	....	2 69
110	3 00	2 95	3 20	....	....	2 73
115	3 05	3 00	....	....	....	2 77
120	3 10	3 05	3 40	3 81	....	2 81
125	3 15	3 10	....	....	....	2 85
130	3 20	3 15	3 40	3 84	....	2 89
135	3 25	3 20	....	....	....	2 93
140	3 30	3 24	3 60	3 83	....	2 97
145	3 35	3 29	....	....	....	
150	3 40	3 34	....	....	....	3 05
155	3 49	3 39	3 80	....	....	
160	3 60	3 42	....	....	....	3 11

Statement No. 9—Continued.

Number of miles	Sums chargeable per ton for grain, by the car load, under bill of Senate Committee on Corporations	Rates prescribed by Illinois Commissioners for grain per ton, by the car load, for roads with the lowest freight grades	Rates (special) charged on grain per ton, by the car load, by Central Pacific Railroad Company on Western and Oregon Divisions	Rates charged for grain per ton, by the car load, by the Illinois Central Railroad	Rates charged per ton on grain, by the car load, by the Peoria and Rock Island Railroad	Rates charged per ton on grain, by the car load, by the Indianapolis, Bloomington & Western Railway
165	$3 71	$3 46	....	$4 05	....	
170	3 82	3 50	$4 20	....	....	$3 14
175	3 94	3 54	4 40	....	....	
180	4 05	3 58	4 40	4 30	....	3 20
185	4 16	3 62	4 40	4 38	....	
190	4 27	3 66	4 40	4 47	....	3 25
195	4 39	3 70	....	....	....	3 29
200	4 50	3 73	5 20	4 56	....	
205	4 61	3 77	....	4 65	....	3 31
210	4 72	3 81	5 40	....	....	
215	4 84	3 85	....	4 75	....	3 35
220	4 95	3 89	....	4 82	....	
225	5 06	3 93	....	....	....	
230	5 17	3 97	....	4 94	....	
235	5 29	4 00	6 00	....	....	
240	5 40	4 04	6 40	5 06	....	
245	5 51	4 08	6 60	....	....	
250	5 62	4 12	6 80	5 19	....	
255	5 62	4 16	....	....	....	
260	5 62	4 20	....	5 28	....	
265	5 62	4 23	7 50	....	....	
270	5 62	4 28	7 50	....	....	
275	5 62	4 32	7 50	....	....	
280	5 62	4 36	....	5 42	....	
285	5 70	4 38	....	....	....	
290	5 80	4 41	....	....	....	
295	5 90	4 44	....	5 56	....	
300	6 00	4 47	....	5 64	....	

An examination of the several above statements will enable Senators to form an intelligent judgment on the operation and effects of the bill reported by the committee and the Assembly bill respectively, and also whether the rates fixed in the bill of the committee are probably as low as they ought to be.

All of which is respectfully submitted.

FARLEY,
Chairman.

MAJORITY REPORT OF COMMITTEE

ON

Counties and County Boundaries,

ON

SENATE BILL No. 301,

AN ACT TO CREATE THE COUNTY OF VALLEJO.

G. H. SPRINGER..........STATE PRINTER.

MAJORITY REPORT.

MR. SPEAKER: A majority of your Committee on Counties and County Boundaries, having had under consideration Senate Bill No. 301, entitled an Act to create the County of Vallejo, beg leave to report the same back, with the recommendation that it do not pass.

The intense interest which has followed this bill in every stage of its legislative progress, and the heated contest which has gathered about it, has given it a prominence and invested it with an importance in legislative and public attention, justifying a brief review of the considerations which led to the conclusions embodied in the recommendation of a majority of your committee.

Divested of its legal verbiage, and condensed to its simplest terms, the bill proposes as follows:

The segregation of Vallejo Township from Solano County, and the erection of said township into a county.

This is its one central object and aim, about which the hottest battle has been made. The details by which the desideratum of the bill is to be attained may be briefly and conspicuously expressed by subdivisions, as follows:

First—The new county shall be called Vallejo County.

Second—It shall embrace limits which will give twenty (20) square miles of territory.

Third—It shall have county officers, designated in the bill, all of whom shall be appointed by the Governor.

Fourth—Solano County, as constituted after the passage of the Act, shall assess, equalize, and collect the taxes for Vallejo County for eighteen hundred and seventy-four.

Fifth—In an obscure clause there is some evidence of an intention to release Vallejo Township of all liability as to the existing debt of the county.

Sixth—The debt of Solano County is to be paid by that county; or, more plainly, the amount released, as against Vallejo Township, is made applicable to and assessed upon the remaining portion of Solano County.

Seventh—It retains Vallejo in the Congressional, Senatorial, and Assembly and Judicial Districts, to which it is now attached.

Your committee gave the contestants a full opportunity to be heard, and the facts elicited amount to this:

Solano has a territorial area of nine hundred square miles, while the proposed new county will have but twenty miles. The movement to divide the county does not originate with the people to be set apart in a new county, but comes from people living in districts outside of the proposed new county. It is, in the plainest and truest sense, an attempt to force a county government upon a township against the unanimous will of its people. Obviously, this would be an act of usurpation and wrong; but when the attendant detail, by which this act is to be consummated, is considered, it assumes the proportion of absolute despotism. These people are not only to be forced into isolated local sovereignty, against their will, but they are to be governed for two years by officers appointed by the Governor, and for the first year the taxes are to be levied, equalized, and collected, by an adjoining county.

Here, then, is exhibited a complete round of despotism—from banishment, to a vassalage under officers appointed by a power outside of themselves, and an assessment and collection of taxes, possessing all the indignity and humiliation of an enforced tribute to a conqueror.

It will certainly appear to the common sense of this Assembly, that if an Act so obnoxious to the true principles of self-government can become law, then the rule of majorities is but another name for absolute despotism.

The only apology offered for this proposed outrage upon a portion of this Commonwealth is, that the electors of Vallejo Township have hitherto exercised the rights of political association and the elective franchise in a manner displeasing to other portions of the county. We fail to see in this a cause of complaint, except such as might be alleged against the independent exercise of the elective franchise in any case.

If the people of Vallejo Township had a right to vote on any proposition affecting the interests of the county, they cannot be criticized for the manner in which they might choose to exercise that right. The apology, then, becomes as obnoxious to the genius of our free government as the act it seeks to justify. The immediate cause of complaint against them relates to the removal of the county seat. The testimony taken before the committee showed that as large a portion of the county is accommodated at Vallejo as at the old county seat. But this removal of the county seat will not justify the wrongs proposed by this bill.

In our opinion, this Legislature cannot afford to appear in the character of avenger of supposed injuries, growing out of local differences in the various counties of the State. What we have to deal with in this, is a question of general policy, and from this standpoint we cannot find justification for this measure.

The bill also proposes the release of Vallejo Township from liability as to existing debt, and the assumption of that debt by the remaining portions of Solano County. This is the exact equivalent of assessing the amount released upon the remaining portion of the county. The assessed value of property in the County of Solano is nine million dollars; three million dollars, or one third of this, is in Vallejo Township. The debt of the county is two hundred and fifty-seven thousand dollars. This makes the part applicable to Vallejo, eighty-five thousand six hundred and sixty-six dollars, and to the rest of the county twice that amount, or one hundred and seventy-one thousand three hundred and thirty-two dollars. This clearly shows that the proposition will increase the debt of the east end of the county fifty per cent.

It is urged that a consolidated city and county government is easy and possible for Vallejo, but it is shown to the satisfaction of the committee that this is erroneous. The proposed new county embraces twelve thousand eight hundred acres; of this, twelve thousand acres is agricultural land, and lying beyond the city limits. Only eight hundred acres are within the city limits. The city, in improving streets and legislating and protecting for city interests, would be compelled to visit taxation upon the larger section which would have no interest in the city proper, and should not be burdened with any of its expenses. Thus it appears that last year the city expended, within its area of eight hundred acres, twenty thousand dollars in street improvements alone. Under the proposed system of consolidation, this burden would have been thrown upon the agricultural holders, who could reap no possible benefit therefrom.

It is further urged, on behalf of the friends of the bill, that the past local and political differences justify the severance sought for. This consideration might have weight if there was any provision in the bill to fit it; for the bill itself provides for the political affiliation of the proposed new county and the old county in the Congressional, Assembly, Senatorial, and Judicial Districts; thus the people, on all the chief elections, would vote without any regard to the contracted and imaginary line drawn by this bill about Vallejo.

A majority of your committee, in conclusion, is fully of the opinion that this whole movement for the division of Solano County, so utterly devoid of public considerations to justify it, arises out of the sectional prejudices which lately culminated in the removal of the county seat—an act which in itself was lawful, consummated under a law which this Legislature has refused to repeal, holding it to be founded upon a correct principle; an act which was accomplished in such strict conformity with law, that no means were to be found to punish the successful contestant, except through this bill.

These sectional differences will be allayed by the healing processes of time, and this no one can reasonably doubt. Any legislation which supervenes upon this abnormal condition of antagonism, will hereafter prove to be a source of regret and discontent. The duty of this body toward this people is clearly set forth in the following language of that eminent jurist, Chief Justice Story, and appeals to us most strongly at this juncture: "There are particular movements in public affairs," said he, "when the people, stimulated by some irregular passion, or some illicit advantage, or misled by the artful misrepresentations of interested men, may call for measures which they themselves will afterwards be the most ready to lament and condemn."

(Signed:)

J. L. HEALD,
S. B. BURT,
G. WINCHELL,
WM. T. CRESSLER,
THOS. REA,
J. D. BYERS.

MINORITY REPORT OF COMMITTEE

ON

Counties and County Boundaries,

ON

SENATE BILL No. 301,

AN ACT TO CREATE THE COUNTY OF VALLEJO.

G. H. SPRINGER.........STATE PRINTER.

MINORITY REPORT.

Mr. Speaker: The minority of the Committee on Counties and County Boundaries, to whom was referred Senate Bill No. 301—An Act to create the County of Vallejo—submit the following report:

The bill proposes to create a new county out of the territory now comprising Solano County. The taxpayers, voters, and citizens, not living in Vallejo Township, are almost unanimous in favor of the passage of the bill. The assessable property of Solano, outside of Vallejo, is seven million one hundred and sixty-six thousand six hundred and forty-three dollars, and the petitioners for division of the present county (seventeen hundred and eighty-two in number) represent more than six million five hundred thousand dollars of this amount. In Vallejo, it is conceded that the citizens, representing two millions seven hundred and forty-one thousand four hundred and two dollars, oppose the measure. The representatives of over two thirds of the property of the entire county demand the passage of this bill.

The reasons given for dividing the county are:

First—The natural antagonism of interests between the Township of Vallejo and the other townships in the county.

The City of Vallejo is a manufacturing and commercial seaport town; a large proportion of its inhabitants being sailors, mechanics, and merchants. The citizens of the other portions of Solano County are principally farmers. The proximity of one of these communities to the other is an advantage to each, but their interests are seldom identical, and measures which benefit one may often be injurious to the other. Neither is competent to decide what is best for the other, yet, when grouped together under one local government, both will attempt it. This provokes distrust and discord between the residents of the different territories. Each section strives for mastery over the other. The successful portion, confident in its numerical voting strength, and despising the weakness of its antagonist, rests satisfied; while in the other portion is awakened the deepest feelings of hatred and bitterness, as a natural consequence of the strife.

This is clearly demonstrated in the present case. A struggle has been going on for years between Vallejo and the farming communities. It culminated in a contest for the location of the county seat. Vallejo was successful, and exhibited a voting strength which has alarmed the other townships. The interests of the two localities are antagonistic. Vallejo has the power, and may use it to the injury of the other parts of the county. The only safety for the latter lies in the division of the county, and this division must be effected so as to separate Vallejo Township, and its commercial interests, from all the other townships, which are purely agricultural.

The business of Vallejo cannot suffer by the division, for the county line is not a Chinese wall, which will intercept trade. If the farmers can buy cheaper or sell their produce better at Vallejo than elsewhere, or if it is more convenient of access than other towns, it will command their trade unaffected by the proposed division.

Second—The discord and want of good feeling existing between the inhabitants of the two portions of the territory.

If sectional difference prevail in a county to such an extent that each section is striving to build up itself to the injury of some other locality in the same county, values of real property must, as a consequence, be fluctuating, and the credit of the county become impaired.

Third—The inconvenience to the majority of the people of the agricultural portion of the county, in having the county seat located in Vallejo, and on the other hand, the inconvenience to the people of Vallejo if it remain at Fairfield.

These propositions are admitted to be true by all interested.

The proposed division must, therefore, in this respect, suit the convenience of the citizens of the entire county, for Fairfield and Vallejo will each be county seats.

Fourth—The economical advantages to both counties arising out of the division.

It has been urged that the creation of two counties out of one, and the increase of county officers incident thereto, will impose an additional burden of taxation on the people of each. This is an error. The salaries of county officers are but a small item in the expenses of a large county. It is the money spent for road building, mileage, expenses in criminal cases, etc., that exhausts its treasury. The proposed County of Vallejo is in compact form. Its roads and bridges are built. It has an abundant revenue to support a county government.

The valuation of property in the Township of Vallejo for eighteen hundred and seventy-three was two million seven hundred and forty-one thousand four hundred and two dollars, and solvent debts, assessable the present year, will increase their assessment to nearly three million dollars. The rate of taxation for State and county purposes for eighteen hundred and seventy-three was one dollar and ninety cents on each one hundred dollars of taxable property. The total amount of taxes collected in the district comprising the proposed new county (less expenses of collection):

For 1873	$51,044 90
Deduct State's portion	13,432 81
Balance for county purposes	$37,612 09
Collected from licenses, 1873	4,630 95
Add 1,500 road polls at $4 00 (amount paid by Board of Supervisors), based on county seat election of November 26th, 1873, shown by the official returns to have been 2,159 votes	6,000 00
Making a total net revenue of	$48,243 04

Under the bill now under consideration, her expenses for salaries are:

Salary of Treasurer	$600 00
District Attorney	1,000 00
School Superintendent	300 00
Auditor	100 00
County Judges	1,000 00
Assessor	1,000 00
Supervisors	300 00
County Clerk	1,000 00
A liberal estimate of her other expenses would be as follows:	
Road work	2,330 00
Contingent expenses	1,554 00
Board of prisoners	2,256 00
Hospital patients	1,972 00
Jury fees (estimated)	600 00
Election expenses	800 00
Expenses on criminal cases	5,000 00
Total	$19,812 00
And leaving a surplus of	$28,431 04

It may not be out of place, in this connection, to remark that the present City of Vallejo levies a tax of seventy-one cents on each one hundred dollars for city purposes. This, added to the State and county tax, amounts to two dollars and sixty-one cents on the one hundred dollars. We would suggest that, by a consolidation of the city and proposed county government, the people of that township might be relieved of much of this tax, and, at the same time, the City Hall could be made to answer for county and city purposes. This furnishes another argument in favor of limiting the territory of the proposed county, as provided in the bill.

With reference to Solano County, if the division be effected, she will be saved the expense of erecting county buildings at Vallejo; since the structures at Fairfield are claimed to be sufficient for the next twenty years. The expense of removing records and erecting buildings, thus saved, will not be less than one hundred and fifty thousand dollars. For costs in criminal cases, mileage, etc., Solano will also save many thousands of dollars by the division.

The following objections are urged by the citizens of Vallejo:

First—The small area of the proposed county. The reply to this is, that it is not the territory, but the population and wealth of a community, which should be considered in forming a local government. It has been shown above that Vallejo is abundantly able to support a county government, and that it would be an advantage to her. Again, the number of square miles in Vallejo Township is scarcely less than in San Francisco, while there are fourteen counties in the State containing less taxable property.

Second—It is urged that this is forcing a township out of a county, and imposing a government upon a people against their wishes. The answer is, that there is but a difference in a name. If the northern portion of the county had asked to withdraw from Vallejo Township, and set up a new government under a new name, it would perhaps have been a more usual if not preferable course, but since Solano has assumed the entire debt of the county, and is to have charge of the records, certainly it should be entitled to the benefit of the name. Nor can we see the injury to Vallejo that ensues from the change.

Third—It is claimed, also, that if a division be had, then the new county should include Green Valley and Benicia Townships.

We have alluded above to the conflict of interests between Vallejo and these agricultural districts. In Benicia Township, the taxable property is five hundred and fifty thousand dollars. Those protesting against division do not represent more than ninety thousand dollars of this amount, while three fourths of the voters demand the passage of the bill. In Green Valley Township, the people are more evenly divided in opinion, but the petitions for division represent by far the largest share of the property. In the county seat election, both these townships gave majorities against the location of the county seat at Vallejo; and this may safely be assumed as an expression of opinion by them in favor of remaining connected with Solano County. It would, also, be easier for Vallejo to consolidate her city and county government, if she was disconnected from these townships.

In conclusion, we cannot hesitate to declare that, to our minds, the advantages arising out of a division of the county more than counterbalance the objections which have been urged against it.

The City of Vallejo seems to have no cause for complaint, nor can she be injured. With one of the finest harbors in the State, the Federal Government each year distributing hundreds of thousands of dollars among her citizens, and situated in close proximity to an agricultural county, the trade of which she may ever retain, if she will not interfere in its politics, Vallejo is destined to become one of the first cities in the State. Solano County, also, with its fine agricultural lands, with markets convenient for the disposal of its products, and with harmony prevailing among its people, will progress more rapidly than heretofore, and rank high among the agricultural counties.

For these reasons your committee recommend the passage of the bill.

E. C. TULLY,
Chairman Committee.
JOHN SIMPSON,
G. W. GIFFEN.

I agree with the minority in the general conclusions arrived at, but differ from them as to the proposed division line.

RUDOLPH KLOTZ.

REPORT

OF

Senate Hospital Committee

ON

INSTITUTIONS NOT UNDER STATE CONTROL.

G. H. SPRINGER.........STATE PRINTER.

REPORT.

Mr. President: The Senate Committee on State Hospitals respectfully report that the institutions named, in the following order, located in the City of San Francisco, which received State aid two years ago, were visited and found in the condition named below.

THE HOME OF THE INEBRIATE

Since December first, eighteen hundred and seventy-one, to December first, eighteen hundred and seventy-three, received as inmates, subject to all the rules of the establishment, seven hundred and fifty-eight, of which the City of San Francisco, through its Police Judge, committed thirty. This institution receives from the County Fund of San Francisco two hundred and fifty (250) dollars per month. From an examination of the books, the committee learn that the actual expense attending the Home of the Inebriate is about four hundred and fifty (450) dollars per month. State aid was furnished, during the past two years, at the rate of one hundred and sixty-six dollars and sixty-six and one third cents per month, making the total from the State, for the time named, four thousand dollars. From donations, as ascertained by the Superintendent, the amount of one thousand nine hundred and eight dollars was received during the same time, leaving the institution with a slight surplus; but, as learned, the amount expended as noted is but for actual expenses, and repairs to buildings and furniture is not placed in the statement. The building was found neat and cleanly, and apparently in proper hands, for the use it is placed to.

SAN FRANCISCO FEMALE HOSPITAL,

Located on Clay street, next received the attention of your committee. The physician in charge, Dr. Deane, after explaining the uses which the hospital was intended for, furnished the following statement as to the number of inmates, amount of receipts and expenditures, and other information that was valuable to aid in the correct compiling of this report.

Physician's report for the two years ending December thirty-first, eighteen hundred and seventy-three:

Admitted	......	371
Discharged cured	351	
Died	3	
Remaining	17	
		371
Births	207	
Other diseases	164	
		371

Of the two hundred and seven births, one hundred and thirty-one were legitimate.

Of the three hundred and seventy-one admitted, one hundred and eighty-three were residents of the County of San Francisco, and one hundred and eighty-eight were residents of other counties in the State.

Besides the above, the poor were treated in the dispensary of the hospital every morning from ten to eleven o'clock, and when not able to buy medicines, it was furnished by the hospital.

(Signed:) C. T. DEANE, M. D.

San Francisco Hospital, in account with Anna M. Conkling, Treasurer, for two (2) years ending December thirty-first, eighteen hundred and seventy-three:

Received.		
State appropriations	$8,750 00	
Calico ball	2,750 00	
Fair	2,185 00	
Donations	2,176 00	
		$15,861 00
Disbursements.		
Rent, gas, water, fuel, medicines, salaries, provisions, expenses of ball and Fair, etc	$15,171 00	
Cash on hand	690 00	
		$15,861 00

(Signed:) ANNA M. CONKLING,
Treasurer San Francisco Hospital.

SAN FRANCISCO FOUNDLING AND LYING-IN HOSPITAL.

The next institution visited was that entitled "The San Francisco Foundling and Lying-in Hospital," located on Jessie street, and under the charge of Doctor Hardy. This charitable establishment contained, at the time of your committee's visit, eight children; but had, just previously to the visit, accommodated a larger number. The same facts as

to the sanitary measures used to prevent disease and to keep the inmates comfortable in other establishments referred to above, can be applied to the San Francisco Foundling and Lying-in Hospital.

THE CALIFORNIA STATE WOMAN'S HOSPITAL,

Located on the corner of Twelfth and Howard streets, had, at the time of the visit of the committee, twelve (12) female patients. The building was found in good condition. The apartments, though small, were neat and comfortable. The statement of the surgeon-in-chief we append, as also that of the Secretary and Treasurer:

To the honorable the Legislature of the State of California:

GENTLEMEN: I have the honor to submit the following report of patients treated at the California State Woman's Hospital, from November thirtieth, eighteen hundred and seventy-one, to November thirtieth, eighteen hundred and seventy-three:

	Nativity.		Religion.		Where from.													Results.				
Total number patients treated	American	Foreign	Protestant	Catholic	Alameda	Amador	Calaveras	Humboldt	Marin	Napa	Nevada	Sacramento	San Francisco	San Joaquin	Santa Clara	Solano	Trinity	Cured	Convalescent	Unimproved	Died	Remaining
138	71	67	94	44	16	1	2	3	10	2	1	4	90	3	1	2	3	79	34	3	4	18

JOHN SCOTT, M. D.,
Surgeon in charge.

Statement of the expenditures of the California State Woman's Hospital, from December first, eighteen hundred and seventy-one, to December first, eighteen hundred and seventy-three.

The expenditures during the above period are embraced in the following accounts, viz:

Rent	$1,260 00
Gas	131 70
Incidentals	669 93
Surgical instruments, drugs, etc	467 46
Salaries of house physician, matron, nurses, and servants	3,661 35
Subsistence	3,205 20
Fuel	403 50
Furniture, bedding, etc	758 69
Total	$10,557 83

NOTE.—The Surgeon-in-Chief received no salary, his services to the institution being gratuitous.

I certify that the foregoing is a correct detailed statement of the expenditures of the California State Woman's Hospital, from December first, eighteen hundred and seventy-one, to December first, eighteen hundred and seventy-three. Under the head of "Subsistence," is entered the entire cost of provisioning the hospital. "Incidentals," include all items not properly chargeable to the other amounts.

J. HUNT,
Secretary and Treasurer California State Woman's Hospital.

San Francisco, December 20th, 1873.

THE INDUSTRIAL SCHOOL.

It became the duty of the committee to also visit the Industrial School, located in the City of San Francisco. In connection with this school is a department, located a great distance apart, in the same county, entitled

THE MAGDALEN ASYLUM.

Both institutions receive State aid, though they are partially local in the benefits that the people who live adjacent to them derive, so far as the City and County of San Francisco is concerned.

The Industrial School contained, on an average, for eighteen hundred and seventy-four, two hundred and seventeen inmates; boys who had been committed by the police officials for all classes of petty crime. So far as the health and comfort of those incarcerated were observed, all that nature required was furnished, though the committee is of the opinion that some provision should be made to separate the older, and probably more hardened criminals, from those so young in years and crime as to be not aware of the offense committed. The female branch of the establishment is conducted under the charge of the Sisters of Mercy, who, in connection with those received from the authorities, also receive from all portions of the State any female child that the parents or guardians cannot control, and who is disposed to lead a vicious life.

Like all institutions under charge of females, the Magdalen Asylum presents a model of neatness. The inmates are taught, as far as possible, to learn such branches of industry suitable to females, and thereby providing for them a chance to obtain a proper standing in society, and means sufficient to prevent them from again associating with the vicious.

The Protestant Episcopal Church Home, or as it is more commonly termed,

THE OLD LADIES' HOME,

Was visited. It is but a repetition to state that this establishment, under charge of ladies, shows that all the comfort possible that can be provided for the inmates is given freely, and in such a manner as to make those who enjoy the benefit feel that in their old age and dotage the younger portion of the community see that they are provided for. The number of occupants—fifteen—are of extreme old age, a few exceeding ninety years.

THE LADIES' PROTECTION AND RELIEF SOCIETY

Having received and enjoyed the benefits of State bounty, was also visited, and found perfect in every detail. This establishment is for children, without reference to orphanage, and, as conducted by the lady managers, appears to be of great benefit to mothers who, through misfortune or other causes, cannot properly care for their offspring.

The committee finding all so deserving, but at the same time believing that such institutions should be entirely under State control, if State appropriations are made, make no suggestions as to the amount that should be appropriated, or in fact the propriety of making any appropriation, unless the entire control of the same is given to State officials.

BUSH,
Chairman Hospital Committee.

TENTH REPORT

OF THE

Board of Directors and Officers

OF THE

CALIFORNIA INSTITUTION FOR THE EDUCATION

OF THE

DEAF AND DUMB, AND THE BLIND,

FOR THE

TWENTY-THREE MONTHS ENDING JUNE 30, 1873.

T. A. SPRINGER.........STATE PRINTER.

BOARD OF DIRECTORS.

J. MORA MOSS.........President.
JOHN C. HAYS.........Vice President.
T. L. BARKER.........Auditor.
E. J. CRANE.
H. LINDEN.
H. A. PALMER.........Secretary and Treasurer.

VISITING COMMITTEE OF LADIES.

MRS. J. MORA MOSS.
MRS. EDWARD TOMPKINS.
MRS. HENRY H. HAIGHT.
MRS. M. T. BONHAM.
MRS. JAMES BEEBE.

OFFICERS OF THE INSTITUTION.

PRINCIPAL.

WARRING WILKINSON, M. A.

TEACHERS OF THE DEAF AND DUMB.

GEO. B. GOODALL, M. A.
FOLAND P. FOWLER.
HENRY FRANK,
WARRING WILKINSON, M. A.

TEACHERS OF THE BLIND.

CHARLES T. WILKINSON, Jr.
MISS ANNIE COMLY.

TEACHER OF MUSIC.

LEWIS ALFORD SEWARD.

DOMESTIC DEPARTMENT.

J. E. SELFRIDGE.........Physician.
EDWARD AUSTIN.........Clerk.
MRS. HARRIET B. WILLARD.........Matron.

MECHANICAL DEPARTMENT.

JOHN D. ZABEL.........Foreman of Shoe Shop.
JOSEPH JEFFERY.........Foreman of Cabinet Shop.
A. J. SCHNEIDER.........Foreman of Basket Shop.
C. PETERSON.........Gardener.

REPORT.

California Institution for the Education
of the Deaf, Dumb, and Blind,
August 1st, 1873.

To His Excellency,
Newton Booth,
Governor of the State of California:

Sir: The undersigned, Directors of the California Institution for the Education of the Deaf and Dumb, and the Blind, respectfully submit this, their report, as required by law.

Since the last report, there have been the following changes in the Board of Directors: On the second of December, eighteen hundred and seventy-two, Mr. T. L. Barker took his seat in place of Mr. C. J. Brenham, resigned, and on the seventh of April, eighteen hundred and seventy-three, Mr. E. J. Crane in place of Dr. Nicholson, resigned.

In the medical department, September second, eighteen hundred and seventy-two, Dr. Van Wyck was elected in place of Dr. Nicholson, and in December, Dr. J. E. Selfridge in place of Dr. Van Wyck.

On January thirteenth, eighteen hundred and seventy-three, Mr. Henry A. Palmer was appointed Secretary and Treasurer, and his bond for ten thousand dollars, approved by the Board, was filed with the Secretary of State, as required under the revised Code.

The receipts from all sources have been eighty-nine thousand three hundred and eighty-nine dollars and thirty-eight cents; the expenditures, eighty-nine thousand one hundred and ninety dollars and sixty-two cents, as per Treasurer's reports, herewith; and the account of the distinct disbursements will be found in the Principal's statements. In these accounts only twenty-three months are included; under the new law all accounts being required to be made up to the first of July.

Number of pupils received during this period:

DEAF AND DUMB.		
Males	9	
Females	4	
		13
BLIND.		
Males	12	
Females	5	
		17

NUMBER OF PUPILS RECEIVED—Continued.

DISCHARGED—DEAF AND DUMB.		
Males	4	
Females	4	
		8
BLIND.		
Males	2	
Females	5	
		7
Died (blind)		1
Remaining in Institution on the first of July		93

The biennial report of the Principal contains a detail of the affairs of the Institution, and other suggestions, which will be found interesting to all, and particularly to the friends of the deaf and dumb, and the blind, whose sympathies have been solicited during the past years.

The Directors are not prepared to give a decided opinion on the separation of the deaf and dumb from the blind by having separate institutions; but as the numbers of each of these unfortunates are so few, comparatively, on the Pacific, and we now have proper accommodations for all under the same roof and the same administration, as a matter of economy to the State, we shall have no occasion for many years to make any change.

Mr. Robert W. Durham, of Butte County, bequeathed a portion of his estate to this institution. The Board of Directors have taken action in the matter by appointing Judge Orville C. Pratt their agent to attend to the same. The real property was sold for forty-five thousand dollars, but an offer of ten per cent over that price having been made, the Probate Court ordered a resale, which will delay the distribution for a period.

During the past six months the institution has occupied quite a prominent position in the public press; and, although the publications were of the most exciting and insidious nature, we are happy to say the discipline of the pupils has continually been maintained, and their studies uninterrupted.

Four out of the five Directors have felt that a great injustice was attempted, and no impartial person can read the evidence taken before the several investigating committees, without being pained to find that persons who should have been the most zealous in their endeavors to promote and extend the benefits of this charity, were conspiring to destroy its usefulness, and struggling to blacken the character of the Principal.

In the early part of January, a number of the blind pupils made to the Directors grave charges against the Principal, his brother, and the management of the institution. The Board thought proper to have a public investigation at Berkeley. The majority of the Board (four out of five), after examining into the matter, found these charges were without foundation, and came to the conclusion the children and more elderly pupils, incited by improper influences, had magnified the smallest grievances into great wrongs.

A continuance of accusations of a much more serious character was persistently published in some of the newspapers, and although these charges were not directly brought before the Directors as a body, they felt it their duty to ascertain what truth there might be in them, and selected eight well known ladies, whose intelligence and standing in society would give force and weight to their decision, six of whom kindly consented to serve.

The subject was of so delicate a nature, their examination was conducted with closed doors. After a searching inquiry, they came to an unanimous verdict that the charges had no truth in them.

Notwithstanding the publication of this complete refutation, new attacks were made through the same influences. At the request of Mr. Wilkinson, your Excellency appointed five eminent gentlemen to examine into the management during his seven years administration.

After a patient and thorough investigation of every matter, however trivial, occurring during that long period; receiving all hearsay and diffusive evidence, devoting more than three weeks to the work, these gentlemen gave their report, vindicating entirely his moral character, integrity, capacity both as teacher and administrator, thus further confirming the majority of the Board in their never varying confidence in Mr. Wilkinson.

The people of this State, and the friends and relatives of pupils, have to congratulate themselves that this noble charity, the usefulness and well being of which was menaced by attacks prompted by the most unworthy motives, has come out of this trying ordeal so triumphantly, and although the persecution of the Principal has been of the most cruel character, very harassing to the Directors and annoying to the many friends of the institution, yet it has resulted in the general belief that no institution, either public or private, where young people of both sexes are educated under the same roof, could have been found in a better condition, both as to its moral, mental, or physical welfare.

The allowances by the last Legislature relieved the Directors during the past two years of much embarrassment. Pledges were given to the Committees of Ways and Means, of both Houses, that the appropriations asked for would be ample, with proper economy, unless some unforseen occurrence should take place. This promise has been kept, and, with no debt, there is a small surplus.

Our needs for the next two years will be for education, food, lodging, repairs, etc., of the interior, three thousand dollars per month, or, for the two years, seventy-two thousand dollars. By the revised Code it is made an obligation to clothe all the pupils. Heretofore, the State has only supplied the indigent pupils with absolutely necessary clothing—many articles being contributed by charitable persons.

We would respectfully recommend the law to be so changed that indigent pupils only shall be clothed at the expense of the State, when it is satisfactorily shown to the Board of Directors that parents or friends are unable to furnish what is necessary.

As the law now stands, it will entail an expenditure for the present and ensuing two years of at least twenty-five hundred dollars per annum; or, in all, the sum of seventy-five hundred dollars.

It is not necessary to enter into a discussion of the food question. The fare heretofore given is, we believe, as good as at any similar institution in the United States or in Europe—and by a majority of the Board thought to be wholesome and ample in every respect; but there appears to be a morbid sentiment in the minds of many that these children should be fed more luxuriously. The Directors have, in consequence, added a greater variety to the bill of fare; the increased cost of which, and the necessary augmentation of employés to prepare the same, will add to our expenses from one thousand to fifteen hundred dollars per annum, and we therefore ask for an additional appropriation, to cover this, of three thousand dollars.

The entrance-front of the institution is still unsightly, without the completion of the terrace, approach-steps, etc., for which we ask the sum of five thousand dollars; for gradual improvement of the grounds, macadamizing the approach-roads, purchasing of trees, etc., the sum of three thousand dollars.

RECAPITULATION.

Items.	Amount.
Two years' maintenance, etc.	$72,000 00
Clothing, if the law is unchanged	7,500 00
Improved bill of fare, if considered necessary	3,000 00
Improvement of approach	5,000 00
Roads, trees, and grounds	3,000 00
	$90,500 00

The bequest of the Swedish sailor, Mongé, was placed at interest, and now amounts to the sum of one hundred and sixty-four dollars and ninety-seven cents.

The interest of the accumulated sum, it is proposed to be expended for premiums, whenever it shall amount to a sufficient sum.

The organ now in the chapel has been purchased and built, at a cost of eighteen hundred dollars, from the fund generously contributed by Mr. Hellman and others. It is said to be a very fine instrument, is now nearly completed, and will be ready for use at the commencement of September. This, without cost to the State, will add much to the enjoyment, and give a further means of earning a livelihood to the blind. There is still in the organ fund the sum of one hundred and thirteen dollars and thirty-eight cents, which will be absorbed in part payment of the case, etc.

All of which is respectfully submitted.

By order of Board of Directors,

J. MORA MOSS,
President.

H. A. Palmer, Secretary.

REPORT OF THE PRINCIPAL.

To the Board of Directors of the California Institution for the Deaf and Dumb, and the Blind:

Gentlemen: I have the honor herewith to submit the usual biennial report, embracing the history of progress and detail of operations of this Institution during the twelfth and thirteenth years of its existence.

NUMBER OF PUPILS.

Since the date of the last report (July thirty-first, eighteen hundred and seventy-one), there have been under instruction one hundred and twelve pupils, classified as follows:

DEAF AND DUMB.		
Males	39	
Females	28	
		67
BLIND.		
Males	29	
Females	16	
		45
Total, both classes		112

There have been admitted since the same date:

DEAF AND DUMB.		
Males	9	
Females	4	
		13
BLIND.		
Males	12	
Females	5	
		17
Total, both classes		30

Classification of Pupils—Continued.

There have been discharged since the same date:

DEAF AND DUMB.		
Males	4	
Females	4	
		8
BLIND.		
Males	2	
Females	5	
Died	1	
		8
Total, both classes		16

HEALTH.

The general health of the pupils for the past two years has been excellent, but during the term just ended we have not been able to escape the epidemics which have been so prevalent in Oakland and its vicinity. Scarlet fever, measles, and whooping cough, have, one after another, gained admission. And though by careful isolation we were enabled to prevent the spread of scarlet fever beyond two or three cases, measles and whooping cough attacked almost every child who had not previously had them. It is, however, a notable evidence of judicious and healthful regimen that diseases whose sequelæ are often so terrible, were not in a single instance attended with unfavorable results, but all the pupils fully recovered in time to spend their annual vacation at home.

For the first time in five years it is my painful duty to announce the death of a pupil—a blind girl, Mary Elizabeth Miles, aged seventeen years. Her malady was typhoid meningitis, which, from the time it became pronounced, made such rapid progress as to baffle the most skillful medical treatment, and she passed away quietly on the fifth of April, eighteen hundred and seventy-three. She was a bright, intelligent girl, a good scholar, a pleasant member of the household, and has left a void not only in the heart of him whose only child she was, but in the institution where for seven years she had been a resident.

In spite of this sad and unusual event, the health record of this institution offers matter for profound gratitude to Him in whose hands are the "issues of life and death," and for a pardonable pride on the part of the management.

It is well known that deafness or blindness is often only the most demonstrative phase of hereditary disease or constitutional weakness. To scrofulous taint is often added the meager and unwholesome diet of poverty, and the deoxygenated air of crowded homes.

When the unfortunate child has the advantage of well-to-do parentage, he is often injured by the scarcely less fatal effeminacy and weakness engendered by mistaken kindness on the part of those who, desiring to smooth his pathway, really sow the seeds of future unhappiness and discontent.

Dr. Blacklock, himself blind from early boyhood, in an article contributed to the Encyclopedia Britannica, and speaking of a sightless child, says, "It is better that he should lose a little blood or even break a bone, than be perpetually confined in the same place, debilitated in his frame and depressed in his mind." With these frequent facts of congenital debility and defective home surroundings, it is no wonder that vital statistics indicate an increased mortality among the blind as compared with the normal population. This increase has been definitely ascertained to be not less than eight per cent.

Such, to a great extent, is the physical material as it enters the institution. The blind, especially, are, as a class, thin of blood, flaccid in muscle, stooping in stature, vague and uncertain in movement. Neglected in manners and person, or, worse still, rendered helpless by over care—under such circumstances, it is not unreasonable to expect that the hospital apartments of the institution would be in constant requisition, and that mortality would be quite up to, if not beyond, the average rate of normal population. But what are the facts? Not unfrequently, for three and four months at a time, our hospital doors are not opened. From the foundation of the institution, there has never been an accident in the way of a broken bone; and whereas, in the most healthy districts, the average mortality is two per cent, in this school, with an average attendance of sixty pupils for thirteen years, there have been but two deaths, or about one fourth of one per cent per annum.

Our record, therefore, proves conclusively, that with an exceptional class of persons, predisposed to disease and early death, and by the nature of their misfortune, liable to accidents, the highest condition of health has been secured, and a complete immunity from casualties, during a long term of years. No intelligent person will need to be told that such desirable results are not simply "luck;" but they are the legitimate outcome of constant supervision and judiciously administered regimen and diet, based upon well defined and sound principles of hygiene.

"THE SCHOOLS."

The mutual relations of mind and body are well understood by the most superficial student of physiology and mental philosophy. Well authenticated instances are not wanting, where the accidental and temporary ailments of the flesh have been laid aside like a garment, under the excitement of great occasion, and, by the force of indomitable will power. While, on the contrary, the brightest intellect always sympathizes with, and not unfrequently succumbs to, the enervation of dyspepsia and indigestion. Carlyle says, that a healthy nature may or may not be great; but there is no great nature that is not healthy.

Now it is very evident, from what has been said before concerning the hereditary and accidental defects of the blind as a class, that their teacher has many and great obstacles to contend with. He has to deal with those who are physically unhealthy, and whose unhealth reacts upon the mental condition. And yet there is a popular notion, that the misfortune of blindness or deafness so sharpens the remaining faculties as not only to compensate for the lost sense in the matter of intellectual achievement, but actually to give a blind or deaf person an advantage. A multitude of names, eminent in science, art, or literature—Homer, Milton, Thierry, Huber, Saunderson, Blacklock, and Prescott—are continually quoted as instances of advanced culture, till we almost wonder that everybody does not, like Democritus of old, put out his eyes to increase his intellectual acumen.

Visitors to the Institution frequently ask, "Don't you find the blind and deaf and dumb much more clever than other people?" Gruff old Sam Johnson most ungallantly remarked that "woman's preaching is like a dog's walking on his hind legs; it is not done well, but you are surprised to find it done at all." And so very likely the above question is engendered of the surprise with which the people witness the reading by the sense of touch, or the threading a needle with the tongue; for it is quite noticeable that those higher attainments which are really creditable attract very little attention. But there is no greater fallacy than this idea of mental superiority in the blind or deaf. These misfortunes as obstacles to intellectual growth are simply appalling. Judicious and skillful teaching, united with indomitable energy, ability, and pluck on the part of the pupil, may, and often does, produce admirable results; but this is only obtained by the expenditure of great mental and nervous force on the part of teacher and pupil.

The difficulties besetting the progress of the deaf mute are chiefly in the way of language. He comes to us at the age of eight or ten years with the elements of thought existing in his mind simply as pictures. His means of expressing wants and emotions are those which Mr. Darwin has shown to be common with the brute creation. His pantomimes are no more like words than is the chatter of birds or the grimaces of a monkey. When his motions have been directed into the defined expression of thoughts, his signs indicate *ideas* rather than the arbitrary symbols of speech. He therefore has none of the benefits of comparative philology. All spoken languages have certain semblances by which, knowing one language, the acquisition of others is facilitated. Yet, Mr. Hamerton, in his "Intellectual Life," says: "A language cannot be thoroughly learned by an adult without five years residence in the country where it is spoken; and without habits of close observation, a residence of twenty years is insufficient." This is not encouraging, but it is the truth. What, then, shall be expected of a deaf mute, whose only opportunities for the acquirement of English are limited to the formulas of the class-room, and occasional conversations with intelligent friends by pen or pencil?

It does not follow, from this inability to express himself idiomatically even after he has finished his course of study, that the deaf mute is ignorant, although Thucydides declares, "to know a thing and not to be able to express it, is all one, as if he knew it not." A person may read French or German, Latin or Greek, with great facility, and not be able to write or think in either language. Indeed, De L'Epeé, the founder of deaf mute instruction, did not hope to make his pupils express their own ideas, and chided his colaborer and successor, Sicard, as chimerical for expecting such results. In a letter dated twenty-fifth of November, seventeen hundred and eighty-five, the venerable Abbe says: "I fear lest you be led away by the desire of making metaphysicians of your pupils. Do not expect that they can ever express themselves in writing; our language is not theirs; theirs is the language of signs. Be satisfied that they know how to translate as we translate foreign languages, without knowing how to think or express ourselves in those languages." And under date of December eighteenth, of the same year, he says: "Don't flatter yourself that your pupils will write

French any more than I can write Italian, although I translate that language very well." The good Abbe would be much surprised if he could sit for an hour among the advanced classes of any well regulated institution of the present day, and read the exercises in history, natural and moral philosophy, chemistry, and similar studies, rendered, perhaps, in queer, unidiomatic, yet perfectly intelligible phraseology, and indicating a clear mastery of the subjects.

The first five or six years in a deaf mute's school life must be mainly devoted to the study of language—to obtaining the key that unlocks to him the stores of human learning, as contained in books. In this pursuit it is not the hundred thousand words of the dictionary that confuse the pupil and dishearten the teacher, but the different uses to which the same words are put, and the different ideas depending simply on conjunction.

Take as a simple illustration, the word "draw." The pupil is taught that "a horse draws a wagon." The pantomime is clear, and corresponds with his daily observation. But to his surprise the next morning's paper, in its notices, says: "The concert drew a large house last night," and he has to learn that in this use "draw" means to attract, and house means "a number of people." After being taught by pantomime how to "draw a mug of cider," the "Clipper" informs him that in the late "mill" Mike McCoole "drew" the first blood from his opponent's "mug." He is told if he is ever so fortunate as to have money on deposit, he must "draw a check" before he can get it. He has seen a schoolmate "draw a picture," but when the heroine of the modern novel "draws a sigh," his admiration for the capacities of art is increased. A magazine criticism commends the scenes of innocence and content which Milton "draws," but on reference to the parlor edition of "Paradise Lost," he finds no illustrations, or only those which Gustave Doré has made. One must confess that the pupil has enough already to confuse him, but when in addition he is told that "a ship draws water," "a cook draws a fowl," "a waiter draws a cork," "money draws interest," and "a minister draws comparisons and inferences," he concludes in despair that the conundrums of language, like poor Dundreary's "widdles," are things "which no fellah, especially a deaf mute fellah, can find out." When to these numerous significations the modifying adverbs "in," "out," "off," "on," "up," "back," etc., are added, and when it is remembered that every peculiar use of a word must be made a special subject of instruction, and retained by a special effort of memory, a keyhole perception may be obtained of the work involved in the education of a deaf mute.

The blind child, on the contrary, enters school with a well developed instrument of thought. Language has come to him without effort and without fatigue. He needs only to recognize from the mouth of the teacher, or on the printed page, words that he knew before. He is prepared to acquire the facts of science and literature, because he has dress with which to clothe them. His difficulties are psychological, not lingual. He talks glibly of trees, flowers, colors, clouds, and sky—all the objects of the material world—with the falsest notions of what they really are. He will describe an inkstand and its use, and not be able to recognize one when put in his hand. The girls are very particular about the shade of ribbons they cannot see, and pout sulkily if the "figure" of their calico is not "pretty."

In the judiciary of the mental faculties, to whose judgment the material facts of creation are submitted, the eye is the Chief Justice—the

Court of ultimate decision. It may be made the "fool of the other senses," but is generally "worth all the rest." Its supremacy is acknowledged by the fact that the highest powers of the subordinate faculties are not called into action until the eye is lost. Without this organ, however, the other faculties are called upon to perform functions for which they were not designed, and while the judgments of these faculties concerning material objects may be, and are, expressed in the arbitrary and set forms of speech in popular use, it is evident that ideas thus derived must rest in perceptions based upon imperfect sources of information, and consequently liable to be false. When Professor Saunderson said that the color *red* seemed to him like the blast of a trumpet, he clearly illustrated what I mean. The notion that when one sense is lost the other senses take up the burden; or, in other words, that the loss of sight is *made up* by the development of hearing, touch, etc., is incorrect. That the acuteness of the other senses is increased by practice, is true, but each sense or faculty is developed only in the line of its own activity, and interprets material phenomena to the brain, each in its own formulas.

This false conception of surroundings exercises an important influence upon the subjective life, and modifies character. If premises are false, conclusions can scarcely be right; or, as Mrs. Browning aptly puts it: "Those who think awry can scarce act straightly."

Lacking the corrective of sight the blind are liable to gross errors of judgment, which gradually settle into characteristics. I once heard Mr. Milburn, the blind preacher, state in the course of a lecture, that if he were to judge of the human countenance by the sound of the voice, he would say there was a shade of querulousness and discontent upon every face. One can easily see the evils that would follow from so simple a misconception as this.

For many of the abnormal characteristics of the blind, injudicious friends are responsible. Every clever thing he does is adjectived as "wonderful," and so he becomes conceited. He hears constant allusions to his "dreadful misfortune" till he comes to regard himself as freed by his misfortune from the reciprocal duties of life, and consequently is selfish. Knowing by a few childish experiences, perhaps, that he can be imposed upon, he constantly fears that he will be, and so becomes suspicious. Accustomed to assistance and the dole of charity from early childhood, he soon assumes that to be a right which is only an alms, and so fails to cultivate that sweetest of graces—gratitude. It is easier to beg than to work, and the charitably disposed find quickest relief to the sympathy that blindness stimulates by giving money, and so he becomes dependent.

These are some of the evil tendencies to which the blind are subject, and they are mentioned merely to show that we have not only bodily weakness, and consequently abnormal mental tendencies, to contend with, but also certain infirmities of disposition which it is an important part of our work to correct.

With the general literary progress of the school we have reason to be satisfied. There have been exceptional instances of failure, but as a rule the pupils have appreciated their advantages and improved them.

The classes in the department of the deaf and dumb have been as follows: In Dr. Peet's "Elementary Lessons," three classes; "Course of Instruction, Part III," two; "Scripture Lessons," three; "Life of Christ," one; "Acts of Apostles," one; "Geography," two; "Physical Geography," one; "Select Stories," two; "Written Arithmetic," five; "Mental Arithmetic," four; "Chemistry," one; "Natural Philosophy, Peck's Ganot," one; "Algebra," one; "Paley's Natural Theology," one; "Latin," one; "Writing," three.

DEPARTMENT OF THE BLIND.

"Geometry, Davies Legendre," completed, one class; "Algebra," completed, one; "Written Arithmetic," four; "Mental Arithmetic," three; "Reading," one; "Spelling," two; "Writing," one; "History," three; "Geography," two; "Physiology," one; "Grammar," one; "Political Economy," Perry, completed, one; "Mental Philosophy," one; "Rhetoric," completed, one.

It is my intention, at the opening of the Fall term, to adopt, as far as is practicable, the course of study prescribed for the public schools of San Francisco; to use the same text books; to employ the same questions for examination, and to promote and graduate by the same percentage. This will be one step towards carrying out the spirit of a resolution offered and adopted by unanimous vote at the Convention of the American Association of Instructors of the Blind, held in Boston last year, viz:

> "That the discipline in the schools for the blind should conform to that in schools for the seeing."

MECHANICAL DEPARTMENT.

The Legislature of eighteen hundred and seventy-one and eighteen hundred and seventy-two, made an appropriation of two thousand five hundred dollars for mechanical purposes. This has enabled us to fit up a shop for the blind, and the experiment of teaching basket making is now going on. Perhaps no department of the Institution has caused so much anxious thought as this matter of trades for the blind.

It is not, and never has been, a question of expense; for I believe the Board would be justified in almost any reasonable expenditure of money if thereby the blind could be made independent and self-supporting after they leave the Institution.

The query is, "What trades shall be taught?" It is amusing to see how easily this question is answered by those who know nothing about it, and yet how difficult a problem it is to those who have had the most experience in the profession.

I attended the Convention alluded to above, with the dominant purpose of finding out what others had done in this direction; but I only found that all in the profession are harassed by the same perplexing difficulties. One able and experienced Superintendent boldly took the ground that no handicraft was suited to the needs of the blind, and, by implication, advised the abandonment of all attempts at such means of support. I quote from his remarks:

> "If there is anything in the world that unfits a man for mechanical pursuits from the very start, it is the want of sight. If that be so, what may we infer? That if we would have them succeed, we should educate them to do those things which seeing people do with the least use of the faculty of sight."

He instances agencies of various kinds, keeping small stores, teaching, etc., as among the occupations that may be engaged in profitably; and I have no doubt that a large number of the blind could thus earn a livelihood. But there are many who have not the peculiar qualities that fit them for this kind of life, and to them handicraft of some sort is a necessity.

After long and patient investigation, I determined that basket making and cane seating of chairs offered as fair a probability of success as any industry within the capacity of the blind. A competent foreman is engaged, and the pupils have taken hold of the work with most commendable zeal. Nearly every blind boy can already seat chairs, and many of them can turn out a very respectable basket. It is too early to congratulate ourselves on success, for success depends on whether a graduate can get his living by this trade, and no one has yet gone out into the world to try. Another year ought to demonstrate results.

The shoe shop and cabinet shop are doing well. The deaf mute pupils engaged therein supply all the boots and shoes, furniture and repairs used in the Institution, and we sell considerable to customers in the neighborhood. The time spent in the shops does not interfere with the duties of the class-room, and when our pupils leave the Institution they have an assured means of support, and immediately become part of the productive forces of the State.

IMPROVEMENT OF BUILDING AND GROUNDS.

An appropriation was asked and obtained of the last Legislature for painting the exterior of the building. The sum of fifteen hundred dollars, set apart for that purpose, sufficed not only for the wood, iron, and tin work, as originally designed, but also to paint the roof, and this needed improvement was accordingly ordered by the Board, and has added very much to the appearance of the Institution. The second and third stories of the interior have also been grained in imitation of oak to conform to the first floor, and the whole house varnished. The cost of this work was something less than five hundred dollars.

Not very much has been done towards beautifying the grounds of the Institution, beyond the setting out of trees. The hills to the rear have been planted with eucalyptus trees to the number of several hundred, which are growing finely. About fifteen hundred evergreen and deciduous trees, including Monterey cypress, pinus, insignis, a great variety of acacias and Australian gums, elms, maples, ashes, willows, etc., have been set out, with a fair supply of figs, peaches, apricots, and grapes to supplement the orchard, and almonds, walnuts, chestnuts, and pecan nuts, with which luxuries we hope some day to furnish the tables. The gardener has grown a large number of Monterey and Italian cypresses, and has set out about two thousand feet of hedging of these beautiful trees.

The grading of the playground for boys, to the north of the Institution, is begun, which, when completed, will add much to the pleasure of base and foot ball. The terrace in front and south of the main building was designed to be faced with a rubble wall surmounted with a stone coping. This, with broad steps in front descending to the semicircular plateau forming the second terrace, intended for flowers and low shrubbery, will form a handsome and appropriate finish to the immediate surroundings of the Institution. The grading has settled sufficiently to give a firm foundation for carrying out the original designs, and the work ought to be done the coming year. To do this, and to macadamize the avenue, will require about eight thousand dollars, and I recommend that an appropriation be asked of the Legislature for that amount.

FINANCIAL MATTERS.

The appropriation of three thousand dollars per month, made by the last Legislature, has proved sufficient for the conduct of the Institution. The actual current expenses for the twenty-three months ending June thirtieth, eighteen hundred and seventy-three, have been, as per dissections, sixty-seven thousand and twenty-five dollars and ninety-five cents, to which must be added certain administrative expenses, amounting to three thousand three hundred and eighty-nine dollars and fifty-nine cents, which properly belong to the expenses of the Institution. Itemized, these expenses are as follows:

Pay of Directors	$500 00
Pay of Treasurer	1,099 99
Office rent	227 50
Interest	1,139 50
Collection of warrants	146 23
Office books and stationery	66 37
Legal services	25 00
Carriage hire (Directors and committees)	180 00
Cleaning office carpet	5 00
	$3,389 59

Adding this sum to the amount of current expenses, and we have a total of seventy thousand four hundred and fifteen dollars and fifty-four cents. This includes the materials used in painting the exterior of the building, the support and improvement of the shops, and all the expenditures made for the improvements of grounds, except two thousand and forty-eight dollars and eighty cents paid James Beebe, for grading, and sixty-five dollars paid J. D. Hoffman for surveying. The two latter items will be found in the Treasurer's statements. All the rest, for convenient reference, is itemized in the "Principal's Dissections," herewith annexed. Deducting from the gross current expenses, seventy thousand four hundred and fifteen dollars and fifty-four cents, the sum of four thousand five hundred and eighty-nine dollars and thirty-eight cents cash paid into the treasury as receipts from Nevada pupils, clothing, custom work in shops, etc., and we have a total cost to the State of sixty-five thousand eight hundred and twenty-six dollars and sixteen cents, or a net monthly cost of two thousand eight hundred and sixty-two dollars.

On the first day of July, eighteen hundred and seventy-three, the Treasurer reports a balance, including warrants on the State Treasury due but not payable for want of funds, of six thousand one hundred and ninety-eight dollars and seventy-six cents. Of this amount, two thousand one hundred and forty-three dollars and twenty cents belongs to the Fund for improving the grounds, being the unexpended balance of five thousand dollars appropriated by the last Legislature for that purpose. The further sum of one thousand two hundred and forty-one dollars and sixty-five cents belongs to the Shop Fund, being balance of two thousand five hundred dollars appropriated at the same time for mechanical purposes. Deducting these balances from the gross balance reported by the Treasurer, and we have left two thousand eight hundred and thirteen dollars and ninety-one cents to carry over to the fiscal year ending June thirtieth, eighteen hundred and seventy-four.

With the same economy which has been practiced for the past two years, I think no increase of appropriation will be needed from the Legislature about to convene. Should it be deemed advisable, however, to change very materially the bill of fare heretofore furnished the pupils, it will be necessary to ask an addition of three thousand dollars to the amount appropriated last session, making a total of seventy-five thousand dollars for the two years ending June thirtieth, eighteen hundred and seventy-six.

The attention of the Legislature should be called to the fact that by the revised Code the expense of clothing all the pupils, rich and poor alike, is thrown upon the Institution. It must have been an oversight, for a section so unprecedented could never have been intended by the Commissioners. It would involve an increase of expenditures of not less than two thousand five hundred dollars per annum, and I presume it will be necessary only to direct attention to the matter to have it remedied.

UNION OF THE DEAF AND DUMB AND THE BLIND.

During the last few months a series of disagreeable events has occurred, with which the public is acquainted and wearied, and to which I should not refer, had not the advisability of gathering the deaf and dumb and the blind into one institution been called in question. Well meaning friends here and at the East have written me, trusting that my bitter experience will convince me of the impossibility of keeping the two classes together. I see as yet no reason to change the opinion formed six years ago. The same well planned building is here; the same motives for economy exist; the same benefits set forth in my eighth report are to be had.

To show that I am not quite alone in my advocacy of this measure, I quote from a letter written by Dr. S. G. Howe, of Boston, in acknowledgment of the report mentioned:

> "You speak (page fifteen) of the benefit to be derived from union of mutes and blind in one establishment. I have long held that very great mutual advantage might be had from such union. I do not believe in large aggregations of defectives; the evils thereof are manifest. They are, however, all intensified by the homogenity of its inmates. It is more objectionable to have two hundred mutes or two hundred blind in one establishment than to have one hundred of each class."

I do not care to repeat what I have formerly said in regard to the benefits to be derived from this union, but the almost universal objection brought up in every discussion of the question is, that the deaf and dumb and blind ought not to be gathered in one institution, because they are so unlike; because the modes of instruction are different; because they are unlike in disposition, and require different apparatus and

discipline; in short, that there are no points of similarity, and therefore they ought to be segregated.

To my mind, it is this very unlikeness that makes union desirable. In natural physics the current of electricity is set in motion by connecting opposite poles, and so in moral dynamics character is modified in the contact of unlikes. Everybody knows the mal-effects of being surrounded by hypochondriacs and diseased persons, such as one finds at certain medicinal springs. On the contrary, too much stress cannot be laid upon the importance of abnormals associating with strong, healthy natures. Cheerfulness and change are often the best medicines. The theater is sometimes better than therapeutics. "Go and see Liston," used to be Abernethy's advice to dyspeptics in the day of that celebrated comedian.

I have referred in previous pages to some of the evil tendencies to which the blind are subject, and there are others, which the experience of each teacher will suggest to him. These tendencies are largely due to isolation or segregation of the blind as a class. They are inseparable to institutions of this kind, but they may be reduced to a minimum by uniting an opposite element like the deaf and dumb.

I therefore do not propose to abandon a conclusion reached after mature reflection, because certain malign influences have for a time worked unhappiness and discontent. As well might Dr. Howe, whose venerable years and vast services should have protected him from such assaults, abandon the cause of blind instruction, because he was investigated for "cruelty." As well might Mr. Wait, of the New York Institution, withdraw his valuable services from the profession, because a few malcontents strove to ruin where they could not rule. As well might the Ohio Institution close its doors, because its management was charged with providing "insufficient diet." Half of the physical and moral features of modern civilization would still be dormant in the minds of inventors and philanthropists, had heed been paid to the discouragements that beset them. To such, experience of difficulties stimulates to greater exertion; persecution only nerves the honest purpose.

IN MEMORIAM.

Far removed as we are from our Eastern colaborers, an allusion to a notable event in the history of the profession will not be out of place. We refer to the death of H. P. Peet, L.L.D., for thirty-six years Principal of the New York Institution for the Deaf and Dumb. No man, since the time of De L'Epeé, has done more to advance the cause of deaf mute instruction. No man ever brought higher qualifications to his work, and it is no disparagement to others to say that no man ever achieved more gratifying success. He lived to see the institution he found so feeble, raised by his judicious management to the first rank in size, appointments, and results, and died mourned by hundreds whom he had helped to educate.

ACKNOWLEDGMENTS.

In accordance with that spirit of liberality which has ever characterized the Central Pacific Railroad in its relations to this Institution, Governor Stanford has continued to grant passes to the pupils, by means of which many who otherwise would be compelled to stay here during vacation, renew their family ties and enjoy a change of air and scene. The money value of these passes, issued year after year, is not only very considerable, but the generous manner in which they are granted doubles their worth. I therefore desire, in behalf of the pupils, to thank Governor Stanford and Superintendent Towne, not only for the favors conferred, but for the personal courtesy with which applications have always been received.

The following newspapers have been sent free to the Institution for the use of the pupils, and we hereby tender thanks in their behalf to the proprietors: *Daily Examiner*, San Francisco; *Daily Chronicle*, San Francisco; *Daily Record*, Sacramento; *Weekly Deaf Mute Advance*, Jacksonville, Illinois; *Monthly Chronicle*, Columbus, Ohio; *Monthly Pelican*, Baton Rouge, Louisiana; *Weekly Independent*, Mexico, New York.

And now, closing the record of two years, we are about to enter upon the active duties of another term. We look forward with hope to the coming future. Gathering wisdom from experience, encouraged by the confidence of friends, zealous to do the right as it is given us to see it, thankful for the trust and coöperation of four intelligent Directors, striving more than ever to deserve their esteem, above all humbly invoking the help of God and the guidance of His spirit, we respectfully submit this report.

WARRING WILKINSON, Principal.

INSTITUTION FOR DEAF AND DUMB AND BLIND,
Oakland, July 31st, 1873.

PRINCIPAL'S DISSECTIONS

Of current expenses, for twenty-three months ending June thirtieth, eighteen hundred and seventy-three.

Groceries and Provisions.		
Bacon, 154 pounds	$21 80	
Barrels, 5	25 00	
Bath brick, 7¼ dozen	7 13	
Beans, 810 pounds	39 31	
Blueing, 72½ pounds	30 40	
Bread	29 20	
Buckwheat, 1,400 pounds	76 50	
Butter, 8,383½ pounds	2,891 06	
Canned oysters, 16½ dozen	53 87	
Capers, 4 dozen	13 25	
Carraway seed, 6 pounds	1 40	
Cheese, 1,204½ pounds	204 64	
Chocolate	3 85	
Cider, 1½ gallons	1 50	
Citron, 15 pounds	8 75	
Coffee, 2,184½ pounds	430 86	
Cracked wheat, 255 pounds	10 95	
Crackers, 1,437 pounds	89 33	
Cream tartar, 35 pounds	13 25	
Dried fruit	127 92½	
Eggs, 287 dozen	121 58	
Fish, fresh, 2,001 pounds	173 37	
Fish, salt, 982 pounds	75 37½	
Fish, shell	2 75	
Flour, 242 barrels	1,547 23	
Fruit	159 75	
Gelatine, 2 dozen	4 35	
Ham, 114¾ pounds	20 21	
Hominy, 479 pounds	22 35	
Hops, 17 pounds	7 25	
Ice	14 05	
Ice cream, 5 gallons	15 00	
Jelly	1 00	
		$6,244 24
Carried forward		$6,244 24

CURRENT EXPENSES—Continued.

Brought forward		$6,244 24
Lard, 833 pounds	$121 26	
Lemon and other extracts, 6 dozen	10 50	
Maccaroni, 4 boxes	7 25	
Meal, 535 pounds	19 16	
Meat, 50,679 pounds	4,417 87	
Milk, 53 gallons	5 70	
Mustard, 45 pounds	15 70	
Nutmegs, 5 pounds	6 11	
Pearl barley, 25 pounds	1 75	
Pepper, 91 pounds	26 95	
Pepper sauce	75	
Pickles	23 00	
Pork, 1½ barrels	40 00	
Potash, 6 dozen	11 75	
Poultry and game	162 92	
Rice, 1,050 pounds	92 50	
Sago, 45 pounds	4 75	
Salad oil, 3½ dozen	24 75	
Sal soda, 2,012 pounds	82 43	
Salt, dairy, 2,260 pounds	36 38	
Saltpetre	3 05	
Salt, pickling, 1,110 pounds	11 42	
Smoked beef, 50 pounds	6 50	
Soap, laundry, 3,830 pounds	265 09	
Soap, castile, 395 pounds	53 22	
Soda, carbonate, 16 pounds	1 46	
Spices	20 86	
Starch, 552 pounds	60 54	
Sugar, brown, 7,472½ pounds	738 83	
Sugar, crushed, 1,657 pounds	222 72	
Sugar, powdered, 610 pounds	86 53	
Syrup, 223½ gallons	136 73	
Tapioca, 10 pounds	50	
Tea, 480 pounds	296 25	
Vegetables	438 38	
Vinegar, 258½ gallons	89 81	
Washing powder, 1,198 pounds	92 05	
Yeast and yeast powder	2 70	
		$7,638 12
Salaries and Wages.		
Principal and teachers	$14,810 05	
Physician, Clerk, Matron, and Housekeeper	5,375 00	
Servants and services	5,410 08	
Foremen of workshops	3,838 16	
Engineer, Gardener, and laborers	3,093 73	
		$32,527 02
Carried forward		$46,409 38

CURRENT EXPENSES—Continued.

Brought forward		$46,409 38
Clothing.		
Binding slippers	$ 50	
Blacking and brushes	22 25	
Buttons, needles, pins, and trimmings	64 86	
Calico, 33¼ yards	7 91	
Cambric, 6 yards	75	
Canvas, 8 yards	3 60	
Cloth for aprons	6 00	
Collars, linen—2½ dozen	6 00	
Collars, paper—800	7 60	
Combs	8 60	
Cotton—44 yards	9 50	
Cotton hose—12¼ dozen	36 65	
Cotton tape	1 75	
Darning cotton	65	
Drill—5 yards	1 00	
Flannel shirting—200¼ yards	110 19	
Gloves—1 dozen	2 25	
Hair and tooth brushes	2 00	
Hair nets—1 dozen	88	
Handkerchiefs, colored—4 dozen	10 00	
Handkerchiefs, white—3 dozen	7 38	
Hats, $3\frac{5}{12}$ dozen	46 12	
Hooks and eyes	75	
Machine oil	25	
Merino drawers, 1 dozen	16 80	
Merino shirts, ⅚ dozen	15 50	
Neck ties and bows, 3 dozen	5 25	
Overalls	1 00	
Pants, 8 pairs	69 75	
Pressing hat	75	
Ribbon	93	
Ruffling	50	
Sewing silk	30	
Shirts, check—1½ dozen	12 88	
Shirts, white—5⅓ dozen	92 80	
Spool cotton, 11½ dozen	9 40	
Stockings, 1 dozen	5 00	
Suits, 83	1,282 00	
Suspenders, 5½ dozen	19 00	
Thimbles	1 62	
Thread	4 40	
Waterproof, 6 yards	9 00	
		$1,904 32
Carried forward		$48,313 70

Brought forward		$48,313 70
Furniture.		
Blankets, 63 pairs	$339 75	
Britannia pitchers, 7	21 00	
Brooms, 18½ dozen	75 75	
Carpet binding, thread, and webbing	2 15	
Carpet remnants	2 25	
Castors, 1 set	25	
Cedar pails, $5\frac{1}{12}$ dozen	19 50	
Chairs, 3 dozen	31 50	
Clothes baskets, 3	7 25	
Clothes line	35	
Clothes pins	3 00	
Clothes wringer	16 00	
Coffee mill	1 75	
Cotton mops, 9¼ dozen	27 88	
Crash, 377 yards	60 14	
Crockery and glassware	220 79	
Curled hair	2 00	
Cutlery	80 10	
Drugget and rug	27 53	
Dusting brushes, 2 dozen	9 75	
Dust pans, 2 dozen	6 75	
Enamel cloth, 12 yards	6 50	
Feather dusters	60 09	
Feather pillows, 102	290 40	
Fire extinguishers, 4	240 00	
Flat irons	1 89	
Flue brush	2 00	
Furniture varnish	1 75	
Glassware for museum	23 75	
Glue and glue brushes	11 35	
Gong	7 00	
Hall and kitchen clocks	29 50	
Hall and table bells	10 50	
Keelers, 1 dozen	4 50	
Kitchen hardware and furniture	33 02	
Laundry brushes, 1½ dozen	3 75	
Laundry stove	15 00	
Loco. bell	18 00	
Looking glasses, 2 dozen	30 75	
Matting, 24½ yards	9 80	
Mattresses, "Excelsior," 15	51 00	
Mattresses, hair, 12	135 00	
Mop handles, 1 dozen	3 50	
Napkins, 2 dozen	4 50	
		$1,949 01
Carried forward		$50,262 71

Brought forward		$50,262 71
Nursery lamp	$ 50	
Oil cans	1 35	
Oil cloth, 1½ yards	1 25	
Pianos, 2	830 50	
Piano stool and cover	15 00	
Quilts, 48	84 00	
Repairing mattresses	6 50	
Rubber cloth, five yards	12 50	
Scrubbing brushes, 5⅔ dozen	23 41	
Sheeting, 256¾ yards	81 04	
Stovepipe	75	
Table cover	3 00	
Table linen, 13 yards	9 75	
Ticking, 15 yards	3 00	
Tinware and repairs	138 60	
Tools for use in meat houses	11 75	
Towels, 7 dozen	22 13	
Trimming for chairs	50	
Turning	28 75	
Upholstering, 11 chairs	16 50	
Veneering, 800 feet	50 00	
Waiters	3 00	
Walnut knobs, 2⅙ gross	3 66	
Walnut lumber, 1,718 feet	261 51	
Wash boards, 3	1 16	
Wash tub	2 00	
Wire cloth, 16½ yards	14 45	
Wooden stools, 1 dozen	7 00	
Wood ware	1 40	
		$1,634 94
Building and Repairs.		
Bricks, 15,650	$216 30	
Brick laying	106 87	
Cement, 10½ barrels	54 50	
Door spring	1 50	
Drain pipe	12 00	
Frescoing	230 00	
Frosting glass	2 25	
Glass and putty	165 40	
Grate bars, 595 pounds	36 10	
Iron track, 112 feet	7 84	
Kalsomining	17 00	
Laths, ½ M	1 12	
Lattice, 200 feet	1 00	
		$851 88
Carried forward		$52,749 53

CURRENT EXPENSES—Continued.

Brought forward		$52,749 53
Lime, 13 barrels	$32 00	
Locks	17 80	
Lumber, 19,234 feet	575 65	
Painting and graining	359 25	
Paints, brushes, and oils	813 63	
Plumbing	246 12	
Repairs on boiler	108 45	
Repairs on building	141 00	
Repairs on kitchen range	38 13	
Sand, 12 barrels	12 00	
Sash	4 50	
Shingles, 6¼ M	21 12	
		$2,369 65
Fuel and Lights.		
Candles, 26 pounds	$4 50	
Coal, 286 $\frac{1316}{2240}$ tons	4,373 88	
Coal oil, 230 gallons	104 10	
Coal screen	12 00	
Coke	25	
Gasoline, 2,209 gallons	862 33	
Lamp wicks	3 50	
Matches, 15½ gross	34 50	
Screenings, 2 tons	20 00	
Sperm oil, 4¼ gallons	7 50	
Wood, 14 cords	158 50	
		$5,581 06
Stable Account.		
Beets, 2½ tons	$10 00	
Barley, ground, 6,061 pounds	108 97	
Bran, 15,998 pounds	215 97	
Cattle medicine	6 25	
Chamois skin	60	
Corn, 1,447 pounds	28 85	
Cows, 2	160 00	
Curry combs and brushes	4 65	
Harness oil	4 90	
Harness and repairs	26 87	
Horse blanket	7 00	
Horse keeping	68 50	
Lanterns, 2	3 50	
Middlings, 1,822 pounds	35 16	
Oats, 15,185 pounds	313 07	
Oil meal, 100 pounds	2 25	
Pigs, 2	8 00	
Repairing harness	2 50	
		$1,007 04
Carried forward		$61,707 28

CURRENT EXPENSES—Continued.

Brought forward		$61,707 28
Screenings, 100 pounds	$1 45	
Shorts, 687 pounds	11 68	
Sponge	75	
Straw, 1 ton	7 00	
Varnishing buggy	12 00	
Wagon hire	3 00	
Wheat, 1,393 pounds	32 20	
		$68 08
Miscellaneous.		
Advertising	$11 45	
Alphabet cards	2 43	
Bale rope, 147½ pounds	28 77	
Basket willows	202 74	
Blacksmithing	249 62	
Books and stationery	268 85	
Cane for chair seating	96 60	
Cart	75 00	
Cartage	79 15	
Car tickets	8 60	
Carriage hire	8 75	
Cash to pupils	200 15	
Chemicals	3 00	
Christmas expenses	10 00	
Convention assessment	3 00	
Cutting grain, 12 acres	12 00	
Expenses of clerk and foremen to and from city	41 21	
Expense of pupils returning home	61 95	
Expense of reading room	10 00	
Express charges	184 22	
Fare to concerts for blind pupils	5 00	
Farm and garden implements	78 05	
Ferry tickets	25 30	
Fly cages and fly papers	2 25	
Freight on globe	16 20	
Freight on organ	214 58	
Freight on supplies	67 20	
Fruit, shade, and ornamental trees	333 86	
Fruit wax	5 00	
Gas lighter and tapers	2 75	
Globe	96 12	
Hauling organ	10 00	
Hose pipe and couplings	47 82	
Lamp scissors (two pair)	50	
Laundry work	2 25	
Leather and findings	1,093 18	
Logwood	40	
		$3,557 95
Carried forward		$65,333 21

Current Expenses—Continued.

Brought forward		$65,333 21
Magazines for the blind	9 45	
Medicines	178 05	
Metronome	8 00	
Music and repairing musical instruments	202 95	
Nails, screws, and hardware	198 83	
Paid dentist for pupil	1 50	
Pattern chair for basket shop	12 00	
Picture cord	1 75	
Plowing	107 25	
Postage stamps and Post Office box rent	65 58	
Premium on draft	60	
Pressing hay	71 60	
Printing	29 50	
Proportion of Convention expenses	31 18	
Quods	2 75	
Rattan, 376 pounds	47 00	
Rat traps	1 00	
Repairing clocks	4 75	
Sand and sand paper	2 05	
Shears	1 40	
Silicon	25	
Sponge	65	
Steelyards	2 50	
Stove polish	1 00	
Subscription Deaf and Dumb Annals	54 07	
Telegrams	22 15	
Tin slips for school slates	3 50	
Tools for basket shop	145 25	
Tools for cabinet shop	2 00	
Traveling expenses	105 65	
Traveling expenses L. C. Tuck	150 00	
Type for use of blind	31 40	
Twine	40	
Vegetable plants	5 00	
Vegetable seeds	91 00	
Veterinary services	35 00	
Wheat seed, 995 pounds	24 13	
Whiting	1 25	
Writing boards	7 50	
Writing tablets	32 75	
		$1,692 74
Office items, but included in current expense bills.		
Buggy hire for Mr. Linden	$95 00	
Legal services	25 00	
Carriage hire for ladies' committee	6 50	
Cleaning office carpet	5 00	
		$131 50
Total		$67,157 45

TREASURERS' STATEMENTS.

TREASURERS' STATEMENTS.

H. Linden, in account with the California Institution for the Deaf and Dumb and the Blind, from August first, eighteen hundred and seventy-one, to December thirty-first, eighteen hundred and seventy-two, inclusive.

Dr.

On what account.	Amount.	Total.
To cash from State Treasurer		$46,419 08
To cash refunded by J. Finnegan		300 00
To cash received from Principal:		
To cash for clothing	$1,023 57	
To cash for Nevada pupils	987 50	
To cash for custom work in shops	415 80	
To cash for sales hay	188 65	
To cash for board of workmen	80 85	
To cash for sales of sundries	33 01	
		2,729 38
To cash advances made by Union Savings Bank		15,410 85
Total		$64,859 31

Cr.

On what account.	Amount.	Total.
By balance August 1st, 1871	$7,086 82	
By cash paid Directors	$100 00	
By cash paid Treasurer's salary	800 00	
By cash paid office rent	227 50	
By cash paid E. Gibbon, note	6,000 00	
By cash paid J. K. Prior's heating apparatus, old account	2,209 18	
By cash paid J. Beebe, grading	2,048 80	
By cash paid Wright & Sanders, old account	300 00	
By cash paid J. Stratton, trees	170 28	
By cash paid J. Farwell, painting	893 00	
By cash paid interest	824 99	
By cash paid collection of warrants	110 73	
By cash paid J. D. Hoffman, surveying	65 00	
By cash paid office stationery	44 87	
By cash paid P. R. Sheehan, expert	2 00	
By cash paid current expenses, sixteen months	43,976 14	
		$64,859 31

Treasurers' Statements—Continued.

H. A. Palmer, in account with the California Institution for the Deaf and Dumb and the Blind, from January first, eighteen hundred and seventy-three, to July sixteenth, eighteen hundred and seventy-three, inclusive.

Dr.

On what account.	Amount.	Total.
To cash received from State Treasurer	....	$38,080 92
To cash received from Principal:		
To cash received from pupils	387 19	
To cash received from Nevada pupils	900 00	
To cash received from shop and miscellaneous sources	572 81	
		1,860 00
		$39,940 92

Cr.

On what account.	Amount.	Total.
By Union Savings Bank, advances made to former Treasurer	$15,410 85	
By cash paid Directors' salaries	400 00	
By cash paid salary, H. Linden, former Treasurer	67 81	
By cash paid H. A. Palmer, Treasurer	232 18	
By cash paid A. Pratt, two months' salary	200 00	
By cash paid interest	314 51	
By cash paid collection of warrants	35 50	
By cash paid carriage hire for Directors and committees	78 50	
By cash paid office stationery	21 50	
By current expenses, seven months	22,981 31	
		$39,742 16
By cash on hand	....	198 76
		$39,940 92

LIST OF PUPILS IN THE INSTITUTION

Since August first, eighteen hundred and seventy-one.

DEAF AND DUMB.

MALES.

Names.	Towns.	Counties.
Aronshon, Martin	San Francisco	San Francisco.
Aronson, Moses	San Francisco	San Francisco.
Best, William C.	Suisun	Solano.
Butler, Millard F.	Marysville	Yuba.
Colby, Edwin	Carson City	Ormsby, Nevada.
Craig, William C.	Oakland	Alameda.
Cronin, Edmond	San Francisco	San Francisco.
Cummins, Alva C.	Anaheim	Los Angeles.
Derrick, Francisco	Vallejo	Solano.
D'Estrella, Theophilus	San Francisco	San Francisco.
Doe, Alonzo C	San Francisco	San Francisco.
Gayou, Marcelin	Stockton	San Joaquin.
Grady, Theodore	San Francisco	San Francisco.
Harlan, James C.	Woodland	Yolo.
Hill, Elbridge B.	Oakland	Alameda.
Hill, Mahlon S.	Oakland	Alameda.
Hoke, Harman A.	West Butte	Sutter.
Krantz, Louis	San Francisco	San Francisco.
Mast, Herman X.	San Francisco	San Francisco.
McCabe, J. H.	San Francisco	San Francisco.
McClure, William C	Uniondale	Humboldt, Nev.
McKail, James	San Francisco	San Francisco.
Moesser, George E	Santa Ana	San Bernardino.
Nichols, Henry	Pacheco	Contra Costa.
Oldham, William G.	Santa Rosa	Sonoma.
Phillips, William M.	Yreka	Siskiyou.
Ritchie, Lewis D.	Dutch Flat	Placer.
Robison, J. W.	San Francisco	San Francisco.

Names.	Towns.	Counties.
Rosenbaum, Nathan	San Francisco	San Francisco.
Sandercock, T. Y.	Napa	Napa.
Santa Cruz, José	San Francisco	San Francisco.
Selig, Kossuth	San Francisco	San Francisco.
Shattuck, Frank B	San Francisco	San Francisco.
Smith, Charles	Georgetown	El Dorado.
Thomas, Antony R	Sacramento	Sacramento.
Tilden, Douglas	Chico	Butte.
Willetts, Joshua M	San Francisco	San Francisco.
Wood, Benjamin M	San Buenaventura	Ventura.
Wright, Albert H	Oakland	Alameda.

DEAF AND DUMB.

FEMALES.

Names.	Towns.	Counties.
Aronsohn, Caroline	San Francisco	San Francisco.
Ayres, Dora	Stony Point	Sonoma.
Badger, Harriet F	Petaluma	Sonoma.
Boothe, Meta M	Pope Valley	Napa.
Brown, Harriet L	Virginia City	Storey, Nevada.
Budd, Charlotte	Round Valley	Mendocino.
Caulter, Dora N	San Andreas	Calaveras.
Cronin, Ellen	San Francisco	San Francisco.
Douglas, Caroline	Visalia	Tulare.
Goss, Mary J	Los Nietos	Los Angeles.
Hard, Amy E	Antioch	Contra Costa.
Kerby, Mary	Summit	Plumas.
King, Eliza A	Oakland	Alameda.
Lucas, Maggie	Woodland	Yolo.
May, America	San Francisco	San Francisco.
May, Anna	San Francisco	San Francisco.
McComb, Elizabeth	San Francisco	San Francisco.
McTigue, Augusta	San Francisco	San Francisco.
Nealon, Mary	Marysville	Yuba.
Praut, Fanny E	Angels	Calaveras.
Roesler, Annie K	San Francisco	San Francisco.
Ross, Nellie	Napa	Napa.
Shirley, Evadne	Stockton	San Joaquin.
Street, Catherine	Visalia	Tulare.
Theobold, Catherine	Sheldon	Sacramento.
Uhl, Anna M	San Francisco	San Francisco.
Warren, Annie	Compton	Los Angeles.
Wilts, Mary L	Lafayette	Contra Costa.

BLIND.

MALES.

Names.	Towns.	Counties.
Andrews, Luke	Woodland	Yolo.
Briggs, Eugene	Gilroy	Santa Clara.
Butterfield, L. S	Sacramento	Sacramento.
Casson, H. W	San Francisco	San Francisco.
Catoir, Jacob	San Francisco	San Francisco.
Damewood, Wm	San Francisco	San Francisco.
Dodds, Orrin	Black Point	Marin.
Fancher, Geo. D	San Buenaventura	Santa Barbara.
Foley, Dennis	Eureka	Humboldt.
Hanley, James E	Oakland	Alameda.
Hobon, Patrick	San Francisco	San Francisco.
Jackson, Stephen	San Francisco	San Francisco.
Jones, Chas. J	Grass Valley	Nevada.
Knoblock, Chas	San Francisco	San Francisco.
Leigh, George P	Vacaville	Solano.
Lerch, Charles	Antioch	Contra Cesta.
Lerch, Emil	Antioch	Contra Costa.
Martin, Henry M	Windsor	Sonoma.
McClelland, Bradford	Ukiah	Mendocino
Moore, John T	San Francisco	San Francisco.
Nagle, Harry M	San Francisco	San Francisco.
Orth, Louis	Sacramento	Sacramento.
Otero, Ehudaldo	Los Angeles	Los Angeles.
Smith, Wm. H	Oakland	Alameda.
Sullivan, Dennis	San Francisco	San Francisco.
Thomas, Charles	San Francisco	San Francisco.
Thresher, P. B	Gridley's Station	Butte.
Towle, Wm. H	San José	Santa Clara.
Tucker, John Smith	Petaluma	Sonoma.

BLIND.

FEMALES.

Names.	Towns.	Counties.
Aitkin, Maggie	Benicia Arsenal	Solano.
Dunning, Alice	Watsonville	Santa Cruz.
Fennell, Anna	San Francisco	San Francisco.
Hall, Anna B.	Healdsburg	Sonoma.
Haney, Louisa	Bath	Placer.
How, Pauline A.	San Francisco	San Francisco.
Heryford, Missouri	Lincoln	Placer.
Kelly, Eloise	Marysville	Yuba.
Klink, Maggie	Windsor	Sonoma.
Le May, Ellen	Santa Rosa	Sonoma.
Lovell, Laura	San José	Santa Clara.
McClure, Sarah	San Francisco	San Francisco.
McMahon, Mary	San Francisco	San Francisco.
Miles, Mary E.	Suisun City	Solano.
Morrison, Margaret E.	Oakland	Alameda.
Tenny, Mary A.	San Francisco	San Francisco.

RECAPITULATION.

DEAF AND DUMB.		
Males	39	
Females	28	
		67
BLIND.		
Males	29	
Females	16	
		45
Total		112

TERMS OF ADMISSION.

The California State Institution for the Deaf and Dumb and the Blind is located about four miles north of the City of Oakland. Between San Francisco and Oakland a steam ferry plies almost every hour in the day, and from the latter city a horse railroad is now constructed, which lands passengers within easy walking distance of the Institution.

I. The Institution offers its benefits to all deaf and dumb or blind persons, between the ages of six and twenty-five years, who are of sound intellect and free from vicious habits, and contagious or offensive diseases.

II. No charge is made for pupils from this State, except for clothing and traveling expenses.

III. Pupils from other States or Territories are charged three hundred dollars per annum, payable quarterly in advance. No deduction is made from annual charge, on any account, except in cases of prolonged sickness.

IV. The session begins on the fourth Wednesday of August and closes the second Wednesday of June. Parents are earnestly requested to enter or return their children promptly at the beginning of the term. Only in extreme cases will the pupils be permitted to leave before school closes.

V. Pupils should be provided with comfortable clothing when they enter the Institution, and their wardrobe renewed twice a year.

VI. All moneys designed for pupils should be placed in the hands of the Principal, to whom, also, all letters of inquiry, etc., should be addressed.

Parents or guardians of applicants for admission are requested to furnish written answers to the following questions:

1. What is the name of the applicant?
2. When and where was he born?
3. Is his deafness or blindness from birth; or is it from accident or disease? If so, at what age and from what cause did he become so?
4. Is his deafness or blindness total or partial? If the latter, what is the degree of hearing or sight?
5. Have any attempts been made to remove his deafness or blindness; and if so, what are the results?

6. Are there any other cases of deafness, blindness, insanity, or idiocy in the same family, or among the collateral branches of kindred? If so, how and when produced?

7. Was there any relation between parents or grandparents before marriage?

8. Has the child had the smallpox, scarlet fever, measles, mumps, whooping cough? Has he been vaccinated?

9. What are the names, occupation, residence, and Post Office address of his parents?

10. What are the number and names of their children?

AYRSHIRE BULL, MARS.

TRANSACTIONS

OF THE

California State Agricultural Society

DURING

THE YEAR 1873.

SACRAMENTO:
G. H. SPRINGER, STATE PRINTER.
1874.

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REPORT

OF THE

BOARD OF DIRECTORS.

STATE BOARD OF AGRICULTURE FOR 1873.

PRESIDENT.

R. S. CAREY	Sacramento.

DIRECTORS.

J. J. GREEN	Sacramento.
CHRIS. GREEN	Sacramento.
ROBERT HAMILTON	Sacramento.
M. D. BORUCK	San Francisco.
FRED. COX	Sacramento.
MARION BIGGS	Butte.
COL. C. YOUNGER	Santa Clara.
T. L. CHAMBERLAIN	Placer.
C. H. ROSS	Sacramento.

OFFICERS OF THE BOARD.

Secretary	ROBERT BECK, Sacramento.
Treasurer	R. T. BROWN, Sacramento.

REPORT OF THE BOARD OF DIRECTORS.

To the members of the State Agricultural Society:

GENTLEMEN: In presenting this, our annual report, we do so with great satisfaction, having it in our power to congratulate you on the marked success of the State Agricultural Society, and to establish the fact of its growing usefulness to the rapidly increasing interests of the State. There was a time in its history when it might with propriety have been looked upon as entirely local to California, but latterly its fame has become coequal with that of the State, and in its material rise and progress it has attracted the closest scrutiny of the agriculturists of the East, has now for itself the highest encomiums of those well calculated to judge and form opinions, and in verification of this condition of affairs has been enabled to entertain as competitors a number of leading farmers and stock breeders from beyond the Missouri. From correspondence received, inquiries made, and indications given, we have every reason to indulge in the certainty that contest for recognition from the California State Agricultural Society will not be confined to California, but that the bounteous fields beyond the plains will in the future be largely represented in antagonism to the products of the extreme West, struggling for that supremacy in agriculture, stock breeding, and invention, which, young as she is, has given California a world-wide reputation.

There is not to-day a State in the Union which does not number among its associations and incorporations a State Agricultural Society, supported not only by the patronage of the people, but by direct assistance from the State; and in that respect this society has been peculiarly fortunate. The holding of an annual Fair is looked upon as a gala term, when the people, freed from the cares and anxieties of the plow, loom, and anvil, and the responsibilities of the counting room and office, may meet, and by familiar change of sentiment, by the renewal of old associations and comparisons of results, lead to such change and improvement as to be beneficial to all interested. And in this connection we may be permitted, with pride and gratification, to refer to the State Fair for eighteen hundred and seventy-three, as being the most successful ever held in the State—not only in point of numbers and actual beneficial results, but in a financial point of view. This, of course, could not have been reached without that full coöperation which was so generously extended by the people generally throughout the State, and particularly the people of Sacramento, through whose generosity and liberality we were enabled to complete great and much needed improvements at the Fair grounds, and which has given the State Agricultural Society an impetus which has fully demonstrated that that which the people wills is paramount, and cannot be disturbed.

In this report we desire to call your attention to

THE LEADING EXPORT OF THE STATE,

And to show that during the year eighteen hundred and seventy-three, from July first to December thirty-first, the receipts of wheat amounted to eight million six hundred and thirty-seven thousand one hundred and six centals, or nine hundred thousand tons. Much to the surprise of all interested in the matter, the crop of eighteen hundred and seventy-three turned out to be as great as that of eighteen hundred and seventy-two; showing conclusively that all signs do fail in dry weather.

The next in value as an article of export is

WOOL,

Which has increased every year since attention was first given to its production, until now the clip yields one sixth of all the wool produced in the United States. The largest yield ever claimed in any one year was one hundred and eighty million pounds; and during the past year California yielded thirty-two million pounds, valued at six million dollars. The importance of this product is becoming more and more apparent, realizing in value and amount only second to that of wheat, which of itself could be enhanced by improving the breed of sheep. The present clip yielded about six pounds to the fleece, when by culture and improvement in crossing it could be made to yield twelve pounds to the fleece, thereby doubling the present quantity and value.

THE CULTURE OF COTTON.

That this State is susceptible of producing a large and fine quality of cotton has already been demonstrated in the efforts made by Colonel Strong, the Buckley Brothers, and others, in Merced County. Their efforts have resulted in the production of some cotton as good as can be grown in Mississippi or Alabama, and the yield per acre has been fully as large as in any of the Gulf States. The great argument advanced against the cultivation of cotton in this State, is the high price of labor; but when the increased profits are taken into consideration, this argument at once loses its force. An acre of the very best land in California will not yield annually more than a ton of wheat, which, at two dollars and twenty cents—much above the average price—would bring a return of forty-four dollars. If an acre of suitable land were planted in cotton, and only tolerably well cultivated, a standard bale of four hundred and fifty pounds would be only a moderate yield. This, at fifteen cents per pound—and cotton is now worth from eighteen and three-quarters to twenty-two and a half cents—would bring sixty-seven dollars and fifty cents, or twenty-seven dollars and fifty cents more than a ton of wheat at the present high price. The extra labor required to produce this bale of cotton cannot cost twenty dollars more than required to produce a ton of wheat; leaving a balance of seven dollars and fifty cents in favor of the farmer. This is the argument of those who are now turning their attention to cotton growing in Merced and Fresno Counties, and is the result of actual experience. This year, the gentlemen above named will put in about eight hundred acres of cotton, and as much more will be planted by other farmers in that vicinity. In San Joaquin County, a number of farmers have also been experimenting in this staple product, and the results have been in every case encouraging. Dr. Bartlett will probably put in about five acres this year, on what is known as French Camp Slough; and a number of farmers on the Calaveras and Mokelumne Rivers have expressed an intention of putting in from five to twenty acres each, being encouraged thereto by experiments already made. Altogether, the prospects of California as a great cotton-growing State are becoming brighter each year. Unlike the cereals, cotton does not exhaust the soil, and in this fact is found another strong argument in its favor.

In addition to the parties named above, Joseph Black and Samuel Martin, of Amador Valley, Alameda County, have received a quantity of seed, of the "Peeler Upland" variety, from the Department of Agriculture at Washington, and will make experiments this year. The soil is of the same character as that in the Merced cotton fields, and the climate equally as favorable.

BEET SUGAR.

The reduction of beet sugar has proved a great success, not only in Sacramento, but in Alameda County. About one million dollars is invested in this enterprise. The yield of tons of beets being twenty thousand, from which about three million pounds of saccharine matter was created. This yield will be greatly increased during the coming year.

FINANCIAL.

The receipts of the society for the last year, from all sources, were fifty-one thousand four hundred and twelve dollars and fifty-seven cents; the expenditures, fifty-one thousand four hundred and sixty-two dollars and four cents—expenditures greater than receipts, forty-nine dollars and forty-seven cents.

IMPROVEMENTS AT THE PARK.

Really valuable improvements have been made at the Park since the last Fair—improvements absolutely needed, and which have furnished accommodations which have conduced to the convenience of exhibitors, particularly the stock men. These improvements have been made at considerable expense, greatly adding to the property of the society, and presenting increased attractions, not only to the exhibitor, but those visiting the displays of the society.

THE PAVILION

Is entirely too small for the purposes intended. This was very apparent at the last Fair, and now that a new department has been added (that of "California Inventions"), the necessity of more accommodation is increased.

A NEW GRAND STAND.

It is the intention of the society to tear down the old stand, which has become unsafe, from long use and exposure to the weather, and erect a new one four hundred feet in length and forty-six feet in depth. It will be so arranged that every one will have an excellent view of the entire course and exhibition grounds.

Respectfully submitted.

R. S. CAREY, President.

ROBERT BECK, Secretary.

FINANCIAL REPORT

OF THE

STATE AGRICULTURAL SOCIETY

FOR

THE YEAR 1873.

Date.	On what account.	Amount.
1873.	RECEIPTS.	
Jan. 23 ...	Cash received for memberships	$2,430 00
Feb. 10 ...	Cash received for memberships	35 00
"	From A. A. Wood, on account of rent	300 00
Feb. 19 ...	I. N. Hoag, for memberships sold by him	35 00
Feb. 28 ...	A. A. Wood, account of rent	320 00
April 9....	A. A. Wood, account of rent	200 00
April 12...	A. A. Wood, account of rent	200 00
April 21...	Robert Allen, account of rent	20 00
May 4.....	A. A. Wood, account of rent	200 00
June 4.....	A. A. Wood, account of rent	200 00
July 7.....	J. F. Wilson, entrance money due September, 1872	75 00
"	Penalty	7 50
"	Interest	3 50
July 8.....	A. A. Wood, account of rent	400 00
July 9.....	I. N. Hoag, for memberships sold by C. T. Wheeler and Robert Hamilton	30 00
July 14...	Warrant of State appropriation	5,000 00
August 8	A. A. Wood, on account of rent	300 00
August 15	S. M. Plummer, entry to purse No. 1	60 00
"	G. W. Moulthorpe, entry to purse No. 1	60 00
"	J. H. Breed, entry to purse No. 1	50 00
"	Peter Brandow, entry to purse No. 8	100 00
"	A. C. St. John, entry to purse No. 8	100 00
"	Peter Brandow, entry to purse No. 11	60 00
"	S. Harris, entry to purse No. 11	60 00
"	J. H. Breed, entry to purse No. 12	200 00
"	A. F. Smith, entry to purse No. 13	75 00
"	A. C. St. John, entry to purse No. 13	75 00
"	G. W. Moulthorpe, entry to purse No. 13	75 00
"	A. D. Millard, entry to purse No. 13.	75 00
"	W. A. Findley, entry to purse No. 11	60 00
August 20	Marion Biggs, life membership	45 00

Date.	On what account.	Amount.
August 21	Fred. Cox, life membership	$45 00
August 22	John H. Jackson, membership	5 00
"	O. F. Ayres, membership	5 00
"	Dr. D. Ray, membership	5 00
"	R. H. Newton, membership	5 00
"	H. Hubbard, membership	5 00
"	P. A. Miller, life membership	45 00
Sept. 5	Charles Murphy, entry to purse No. 5	50 00
"	G. R. Buchanan, entry to purse No. 5	50 00
"	John Stewart, entry to purse No. 5	50 00
"	C. W. Clark, life membership	45 00
"	S. W. Sanderson, life membership	50 00
"	Henry Starr, life membership	50 00
"	Charles Traver, life membership	45 00
"	Cash	5 00
"	Geo. W. Scott, life membership	50 00
"	E. C. Singletary, life membership	50 00
"	Grant I. Taggart, life membership	50 00
"	Wm. Watt, life membership	50 00
"	Joseph Perin, life membership	50 00
"	Ira A. Eaton, life membership	50 00
"	T. W. Sigourney, life membership	50 00
"	Chas. Marsh, life membership	50 00
"	Geo. W. Smith, life membership	50 00
"	L. L. Lynch, bar privilege	100 00
"	A. F. Smith, balance of entries	260 00
"	Fred. Cox, for rent of pens at Park from Wetmore	80 00
"	Fred. Cox, for rent of pens at Park from Wetmore	120 00
"	Mr. Saxe, for nine stalls	45 00
"	John Hall, premium returned	30 00
"	Alf. Estell, purse No. 5	100 00
"	Justin Gates, soda privilege	50 00
"	A. S. Greenlaw, cider privilege	103 50
"	A. A. Wood, on account of rent	1,545 00
Sept. 15	Ticket receipts at Park	2,009 00
"	Ticket receipts at Pavilion	1,772 00
"	Entrance money, per Estell	1,055 00
Sept. 16	Ticket receipts at Park	2,062 85
"	Ticket receipts at Gate	237 00
"	Ticket receipts at Pavilion	1,330 00
"	Entrance money, per Estell	1,730 00
Sept. 17	Ticket receipts at Park	2,897 75
"	Ticket receipts at Gate	525 00
"	Ticket receipts at Pavilion	1,169 25
"	Entrance money, per Estell	1,200 00
Sept. 18	Ticket receipts at Park	2,355 00
"	Ticket receipts at Gate	581 55
"	Ticket receipts at Pavilion	1,326 40

Date.	On what account.	Amount.
Sept. 18	Entrance money, per Estell	$585 00
Sept. 19	Ticket receipts at Park	1,763 75
"	Ticket receipts at Gate	428 25
"	Ticket receipts at Pavilion	1,052 50
"	Entrance money, per Estell	885 00
Sept. 20	Ticket receipts at Park	1,370 25
"	Ticket receipts at Gate	305 00
"	Ticket receipts at Pavilion	436 00
"	Entrance money, per Estell	590 00
"	Entrance money, per Ryan	30 50
"	From Theo. Winters	50 00
"	From Ryan (tickets), new stand	63 00
"	From Ryan, balance	16 00
"	From entrance, sweepstakes	388 50
"	From purse No. 10, returned	50 00
"	From Cox, weigh-scales receipts	10 00
"	From Coleman, overplus	43 25
"	Memberships sold by Ryan	420 00
"	Memberships sold by Boruck	215 00
"	Memberships sold by Beck	130 00
"	Tickets to new stand	18 00
"	Restaurant privilege	151 00
"	From Paul Morrill, memberships issued by I. N. Hoag	180 00
"	T. B. McFarland, life membership	50 00
"	Grove L. Johnson, life membership	45 00
"	George Lorenz, life membership	45 00
"	W. S. Cothrin, life membership	45 00
"	H. Winters, life membership	45 00
"	Ed. Cadwalader, life membership	45 00
"	Robert Gardner, life membership	50 00
"	E. H. Miller, life membership	45 00
"	G. A. Gotthold, life membership	45 00
"	J. A. Hutchings, life membership	45 00
"	E. K. Alsip, life membership	45 00
"	S. Poorman, life membership	45 00
"	C. B. Mott, Jr., life membership	45 00
"	G. W. Chesley, life membership	45 00
"	S. M. Reddington, life membership	45 00
"	H. G. Smith, life membership	50 00
"	J. McNeil, life membership	50 00
"	C. Knoblock, life membership	45 00
"	D. J. Simmons, life membership	45 00
"	W. R. S. Foye, life membership	45 00
"	J. Suverkrup, life membership	50 00
"	Justin Gates, life membership	45 00
"	Albert Galatin, life membership	45 00
"	Newton Booth, life membership	45 00
"	J. Q. Brown, life membership	50 00

Date.	On what account.	Amount.
Sept. 20...	J. M. Keller, life membership	$45 00
"	Obed Harvey, life membership	50 00
"	R. Williamson, life membership	45 00
"	A. Aitkin, life membership	45 00
"	W. Sharp, life membership	50 00
"	B. Dennery, life membership	50 00
"	T. J. Clunie, life membership	45 00
"	Horatio Hurd, life membership	45 00
"	S. C. Denson, life membership	50 00
"	C. H. Swift, life membership	45 00
"	W. F. Swimley, life membership	45 00
"	L. Powers, life membership	45 00
"	J. P. Lowell, life membership	45 00
"	David Bush, life membership	45 00
"	Julius Wetzler, life membership	45 00
"	L. L. Lewis, life membership	45 00
"	R. C. Terry, life membership	45 00
"	Fred. Baehr, life membership	45 00
"	J. J. Green, life membership	45 00
"	G. W. Locke, life membership	45 00
"	Wm. M. Lyon, life membership	45 00
"	R. C. Clark, life membership	45 00
"	D. H. Quinn, life membership	45 00
"	Dr. R. W. Murphy, life membership	50 00
"	E. Lyon, life membership	45 00
"	S. W. Butler, life membership	45 00
"	J. Routier, life membership	45 00
"	Wm. Dresbach, life membership	45 00
"	E. F. Bane, life membership	50 00
"	M. D. Boruck, life membership	45 00
"	S. J. Nathan, life membership	45 00
"	H. Wachhorst, life membership	45 00
"	James Carolan, life membership	45 00
"	P. H. Russell, life membership	45 00
"	J. F. Whyte, life membership	45 00
"	A. A. Van Voorhies, life membership	45 00
"	F. R. Dray, life membership	45 00
"	A. Heilbron, life membership	45 00
"	George B. Dreman, life membership	45 00
"	John Funck, life membership	50 00
"	G. W. Hancock, life membership	45 00
"	William Todhunter, life membership	50 00
"	James Farris, life membership	45 00
"	Theodore Winters, life membership	50 00
"	William A. Johnson, life membership	50 00
"	William A. Pritchard, life membership	45 00
"	George Cox, life membership	50 00
"	Charles Robin, life membership	45 00
"	C. M. Chase, life membership	45 00
"	Phillip Callahan, life membership	45 00

Date.	On what account.	Amount.
Sept. 20...	Thomas Hague, life membership	$45 00
"	Drury Melone, life membership	45 00
"	Wilfred Page, life membership	50 00
"	Daniel Flint, life membership	45 00
"	Charles Heisen, life membership	50 00
"	Benjamin Bullard, Jr., life membership	45 00
"	L. C. Chandler, life membership	50 00
"	T. L. Chamberlain, life membership	45 00
"	Chase & Co., pool privilege	2,500 00
"	William Hamilton, life membership	50 00
"	R. S. Carey, life membership	45 00
"	L. L. Baker, life membership	50 00
"	A. A. Wood, rent of Park	500 00
1874. January 3	A. A. Wood, for rent	741 67
"	W. K. Vanderslice, life membership	50 00
	Total	$51,412 57

RECAPITULATION.

Annual memberships previous to Fair	$3,523 00
Ticket receipts at Pavilion	7,112 65
Rent for privileges at Pavilion	404 50
Rent of Park	4,185 00
Receipts at Park during Fair	14,850 25
Entrance money on races	7,671 00
Pool privilege	2,500 00
Purses returned	150 00
Premium returned by John Hall	30 00
Entrance sweepstakes stock	388 50
Life memberships	4,805 00
State appropriation	5,000 00
Total	$51,412 57

Date.	On what account.	Amount.
1873.	DISBURSEMENTS.	
Jan. 22 ...	Amount overdrawn on Treasurer	$1,091 71
“ 23 ...	Cash paid *Sacramento Journal*	3 00
“	Cash paid expressman delivering diplomas	1 00
“	Wells, Fargo & Co., envelopes	2 50
“	Post Office box rent	4 00
“	Matches	50
Feb. 1 ...	D. Gardner, wood	10 00
“	J. E. Parker, “Thos. Showlars,” premium	10 00
“	*Daily Record*, advertising	10 00
“	H. S. Crocker & Co., stationery	49 00
Feb. 3 ...	Robert Beck, salary for January	141 00
“	Vanderslice & Co., bill for medals and silverware, 1872	429 67
Feb. 8 ...	Gas bill	3 00
Feb. 9 ...	Dewey & Co., advertising, 1872	25 00
Feb. 10 ...	Mrs. L. Bruckerman, premium	3 00
Feb. 11 ...	R. C. Terry & Co., bill	5 00
Feb. 18 ...	Drayage on trees to Park	1 00
“	Express charges on reports sent to Emigrant Union	1 50
“	Express charges on fruit trees	75
“	Map of the United States and World	2 50
Feb. 19 ...	James Kelly, one share Union Park stock	100 00
Feb. 20 ...	I. N. Hoag, salary for January	125 00
“	Dewey & Co., advertising bill	4 00
Feb. 21 ...	R. C. Clark, legal services	100 00
Feb. 22 ...	Huntington, Hopkins & Co., premium	20 00
“	Mrs. J. P. Odbert, premiums	15 00
Feb. 25 ...	E. J. Sparks, premiums	10 00
Feb. 27 ...	Samuel Jelly, bill for premiums	76 50
“	James McGuire, bill	6 00
Feb. 28 ...	Robert Beck, salary for February	166 66
“	Samuel Cross, deed for property in Park	100 00
“	J. H. Coffee, balance in full for building stand	68 66
March 1.	Whittier, Fuller & Co., bill	10 50
March 8.	Sayles & Williamson, walnut trees	30 00
March 31.	Robert Beck, salary for March	166 66
“	D. Gardner, wood	13 00
“	Hiram Block, labor	13 00
“	Recording Dunlap & Cross' deed	2 00
“	Postage stamps	3 00
“	Postage on Los Angeles report	25
April 1...	G. W. Mayberry, labor at Park	150 00
April 2...	Post Office bill	4 00
April 19...	Mrs. J. P. Odbert, premium	5 00
April 21...	Robert Allen, moving tanks	96 80
May 2....	Robert Beck, salary for April	166 66
“	J. Bithel, bill	3 00
May 2.....	Key to Post Office box	$ 50
“	One hundred trotting rules	6 10
“	Express charges on same	3 40
“	Postage stamps.	3 90
May 3.....	Gas bill	3 60
“	Nichols, Falvey & Co., boxes	2 00
“	James Holland, premium	10 00
“	Laufkotter Bros., boring well, etc	19 00
May 4.....	Wells, Fargo & Co., express charges on card rules	2 60
“	Express charges on pamphlets	50
May 16...	Sacramento Directory	3 00
May 17...	John A. Todd, lumber bill	114 22
“	H. S. Crocker & Co., stationery	24 25
“	H. Wachhorst, silverware, premium	64 00
May 22...	Mrs. A. O. Cook, premium	5 00
“	Postage stamps	20 00
May 26...	First and twelfth volumes American Horse Book	14 62
“	D. O. Cook, addressing and sending premium posters, per *Weekly Union*	10 00
June 1.....	Express charge on posters	1 50
“	Robert Beck, salary for May	166 66
June 13...	National Turf Congress for April (currency, $75)	64 87
June 14...	Geo. W. Mayberry, work at Park	26 25
“	Postage stamps ($11 60 currency)	10 00
“	Charges on Post Office order to National Turf Congress	40
“	Postage stamps ($22 50 currency)	20 00
“	Express charges on certificates and posters	1 90
June 30...	Robert Beck, salary for June	166 66
July 11...	National Turf Congress, ten per cent penalty on Wilson's entry	7 50
July 12...	James Sweeny, bill of work on east wall	11 00
July 14...	Samuel Jelly, bill for silverware	11 50
“	James F. Stratton, fifty eucalyptus trees	3 50
“	James F. Stratton, premium	50 00
“	Post Office bill	4 00
July 18...	Postage stamps ($22 65 currency)	20 00
July 28...	Express on special programmes	50
July 29...	Sharpening and repairing shears	50
“	Express charges on circulars.	50
“	R. B. Patton, on account of salary	30 00
“	I. N. Hoag, for finishing report	100 00
July 31...	Wm. P. Coleman and Thomas Gardner, for three lots between Twenty-second and Twenty-third, F and G streets	900 00
Aug. 1.....	James McCleary, carpenter work at Park	40 50
“	H. J. Vail, labor at Park	18 75
“	P. Hawkins, carpenter work	30 00
Aug. 2.....	Robert Beck, salary for July	166 66

Date.	On what account.	Amount.
Aug. 2	P. A. Miller, on account of brickwork	$200 00
"	R. B. Patton, on account of salary	10 00
"	Peter Chatterton, on account of carpenter work at Park	30 00
Aug. 5	John R. Cary, labor at Park	15 00
"	J. Connel, carpenter work at Park	54 00
"	Sacramento City Railroad Company, for one lot between Twenty-second and Twenty-third, F and G streets	300 00
Aug. 9	John R. Cary, labor at Park	5 00
"	P. A. Miller, on account of brickwork	200 00
"	R. B. Patton, on account of salary	25 00
"	G. W. Mayberry, carpenter work at Park	40 00
"	Henry Ramsey, carpenter work at Park	30 00
"	John Crowley, carpenter work at Park	50 00
"	William Ainsworth, carpenter work at Park	30 00
"	Thomas Hammond, carpenter work at Park	30 00
"	John Nicholson, carpenter work at Park	30 00
"	George Thomas, carpenter work at Park	30 00
"	James Hathaway, carpenter work at Park	10 00
Aug. 12	F. S. George, on account of two half blocks of ground between Twenty-second and Twenty-third, F and G streets	625 00
"	George Thomas, carpenter work at Park	30 00
"	Express charges on reports	75
"	Express charges on reports	50
"	Repairing chairs	2 00
"	Ice bill	1 40
Aug. 15	Express charges on A. F. Smith's entry	37
"	Express charges on S. Harris' entry	38
Aug. 19	Telegram to Wheatland	40
Aug. 20	Eli Blancher, labor at Park	18 12
"	Elias Crowell, labor at Park	18 12
"	James Tamer, labor at Park	20 00
"	Henry Myers, team work	82 50
Aug. 22	P. A. Miller, balance on brick work	549 00
"	Richard O'Riley, labor at Park	16 87
"	Express charges on Wisconsin reports	2 65
"	Vanderslice & Co., bill silverware	20 75
Aug. 27	R. B. Patton, on account salary	20 00
"	G. Morris, labor at Park	12 50
Aug. 28	Fred. Wold, labor at Park	21 25
"	W. Flanery, labor at Park	36 25
"	Richard O'Riley, labor at Park	6 25
"	Hugh Latham, labor and hauling at Park	40 25
"	Wrapping paper for fruit sent to Boston	1 50
"	Postage stamps	5 70
"	Postage stamps on handbills	14 90
Aug. 30	G. W. Mayberry, work at Park	14 00
"	G. W. Mayberry, carpenter, on account Park	50 00

Date.	On what account.	Amount.
Aug. 30	Josiah Sorrel, labor at Park	$5 00
"	Henry Ramsey, labor at Park	30 00
"	John D. Crowley, labor at Park	50 00
"	William Ainsworth, labor at Park	30 00
"	Thomas C. Hammond, labor at Park	30 00
"	N. Hathaway, labor at Park	20 00
"	James Gilbert, labor at Park	20 00
"	J. H. Hyde, labor at Park	20 00
Sept. 4	Robert Beck, salary, August	166 66
Sept. 11	William Landerkin, carpenter work at Park	30 00
Sept. 13	Marshal & McGowan's bill, bolts	43 46
"	William Davis, labor at Park	6 25
"	N. D. Green, labor at Park	12 50
"	William Blair, labor at Park	15 00
"	K. Crowley, labor at Park	6 25
"	Silas Graves, whitewashing Park	40 00
"	John Husdedder, labor at Park	19 37
"	R. Overhaul, whitewashing Park	30 00
"	T. S. Springer, carpenter at Park	24 00
"	Sam. Galloway, labor at Park	11 25
"	James Nixon, labor at Park	10 00
Sept. 15	Phil. Flinn, labor at Park	27 50
Sept. 16	John Nicholson, labor at Pavilion	16 50
"	M. O'Hara, labor at Pavilion	16 50
"	John Lover, labor at Park	2 50
"	R. B. Patton, on account salary	40 00
"	M. D. Boruck, bill for advertising and printing rules	167 50
Sept. 17	Purses for regatta	445 00
"	James L. Dunn, royalty on Pardy tickets	150 00
"	James L. Dunn, clerks and gate-keepers	288 00
"	Charles Melhado, waiting on reporters' stand	12 50
"	Colonel Warren, advertising	25 00
"	John Hall, premium	50 00
"	James Gorman, labor at Park	14 37
"	John Husdedder, labor at Park	17 50
"	Will. Carey, for hay	433 94
"	Dan. Collins, hauling at Park	120 00
"	City Band, music	450 00
"	Thomas Hammond, carpenter at Park	110 00
"	A. A. Wood, for fixtures	170 00
"	Coleman Younger, premium	75 00
"	Smith & Chapman, premium	35 00
"	Miller & Seiver, premium	90 00
"	J. L. Merrill, premium	10 00
"	Mrs. J. Haskell, premium	3 00
"	Miss M. J. Little, premium	10 00
"	P. H. Fisher, premium	25 00
"	G. W. Hancock, premium	55 00
"	Miss Mary Roley, premium	10 00

Date.	On what account.	Amount.
Sept. 17...	F. H. Miller, premium	$45 00
"	E. C. Smith, premium	10 00
"	Sherman & Hyde, premium	20 00
"	Severance & Peet, premium	60 00
"	Marion Biggs, premium	40 00
"	Marion Biggs, premium	20 00
"	T. K. Stewart, premium	15 00
"	William Fleming, premium	50 00
"	S. Treat, premium	30 00
"	Goodwin & Co., premium	10 00
"	Mrs. J. P. Odbert, premium	50 00
"	James Moore, premium	15 00
"	William Hahn, premium	60 00
"	James Cuddy, premium	15 00
"	R. S. Thomson, premium	100 00
"	Parker & Perry, premium	30 00
"	Adams, Wadsworth & Co., premium	25 00
"	Sacramento Beet Sugar Company, premium	20 00
"	Mrs. Julius Wetzlar, premium	15 00
"	Henry Kuhl, premium	15 00
"	Baker & Hamilton, premium	135 00
Sept. 24...	Moses Sprague, hay	326 00
"	Aiken & Luce, premium	115 00
"	John H. Wolf, premium	6 00
"	Fred. Cox, premium	20 00
"	Waterhouse & Lester, premium	10 00
"	J. H. Carrington, premium	3 00
"	W. H. Milliken, premium	12 00
"	Mrs. G. G. Morgan, premium	5 00
"	J. A. Barr, premium	5 00
"	Alex. McKay, premium	20 00
"	Robert Cowne, premium	35 00
"	L. J. Orcutt, premium	40 00
"	J. J. Cass, premium	15 00
"	E. E. Moore, premium	45 00
"	T. L. Chamberlain, premium	10 00
"	Treadwell & Co., premium	20 00
"	P. N. Woodworth, premium	50 00
"	D. C. Young, premium	170 00
"	C. V. B. Reeder, premium	5 00
"	Barnes & Barber, premium	25 00
"	G. W. Haines, premium	10 00
"	E. W. Walton, premium	5 00
"	Bartley Cavanaugh, premium	5 00
"	Mrs. E. A. Welty, premium	5 00
"	Nichols & Co., premium	78 00
"	Pollard & Carvill, premium	90 00
"	Mrs. Mary E. Coolege, premium	5 00
"	Mrs. E. Vance, premium	5 00
"	J. S. Woolsey, premium	15 00

Date.	On what account.	Amount.
Sep. 24....	M. S. Bowdish, premium	$10 00
"	W. F. Gordon, premium	375 00
"	Robert Beck, premium	225 00
"	Robert Blacow, premium	60 00
"	H. Wilcox, premium	30 00
"	Thomas & Shirland, premium	45 00
"	N. Gilmore, premium	85 00
"	Butterfield & Son, premium	95 00
"	M. Allen, premium	30 00
"	M. A. Cann, premium	5 00
"	J. & J. D. Richards, premium	5 00
"	J. S. Bamber, premium	85 50
"	Jos. Green, premium	50 00
"	W. H. Woods, premium	10 00
"	Bernardi & Selna, premium	30 00
"	Gabrielli & Co., premium	60 00
"	H. Van Every, premium	15 00
"	Chas. Graves, premium	5 00
"	Miss E. Haskell, premium	5 00
"	A. Greer, premium	5 00
"	Youdder, carpenter work at Park	34 00
"	Frank Johnson, ticket clerk	30 00
"	W. Oatman, ticket clerk	30 00
"	Wm. Todhunter, Marshal, horse hire	30 00
"	P. J. Hopper, advertising	10 00
"	F. M. Marshal, carpenter at Park	19 00
"	M. Crone, labor at Pavilion	42 00
"	W. Caswell, posting bills	25 00
"	J. G. Ledly, door keeper	24 00
"	Hugh Latham, hauling brick	7 60
"	Hay and straw from Jackson	7 25
"	G. W. Hancock, Marshal	30 00
"	Beals & White, ushers at new stand	36 00
"	C. H. Wyman, assistant entry clerk	40 00
"	F. A. Miller, as per agreement on display of flowers	70 00
"	E. B. Ryan, entry clerk at Park	75 00
"	J. W. Myers, carpenter	20 00
"	Jos. Smith, stair keeper	24 00
"	Ab. Keithley, door keeper at Pavilion	20 00
"	M. L. Kerman, with hose at Park	40 00
"	W. A. Parks, police at Pavilion	24 00
"	Pat. Rice, police at Park	24 00
"	P. A. Espina, entry clerk, Pavilion	60 00
"	T. J. Swayne, entry clerk, Pavilion	55 00
"	Dr. S. A. Duel, ticket clerk, Pavilion	30 00
"	W. W. Hubbard, ticket clerk, Pavilion	30 00
"	Samuel Deal, police at Park	30 00
"	Wm. Landerkin, carpenter at Park	33 00

Date.	On what account.	Amount.
Sept. 24...	W. W. Barlow, carpenter at Park	$40 00
"	G. F. Lang, storekeeper at Park	24 00
"	A. Green, police at Park	20 00
"	J. D. B. Cook, stair keeper at Park	24 00
"	S. T. Greenwood, ticket clerk, Park	25 00
"	Jacob Schmidt, stairs at Park	24 00
"	W. Springer, carpenter at Park	40 00
"	Harry Lewis' bill	20 00
"	Diego Morales, police	20 00
"	John Clark, police	24 00
"	D. B. Stewart, police	24 00
"	W. D. Green, police	12 00
"	Em. Johnson, police	24 00
"	Joseph Bucher, stair	16 00
"	John Johnson, police	24 00
"	A. Steiner, filling life membership certificates	83 00
"	Seth Wilson, police	16 00
"	D. Beaumont, superintendent upper hall	80 00
"	Isaac Golloway, porter at Judges' stand	27 50
"	G. H. White	30 00
"	John Huff, police at Park	30 00
"	Chas. Simmermacher, labor at Park	44 37
'	Chas. Simmermacher, police at Park	8 00
'	Jesse Slaughter, lunches at Park	25 00
"	C. Curtin, police at Park	20 00
"	B. F. Alexander, stairs at Park	24 00
"	Jas. Gilbert, carpenter at Park	111 00
"	Will. Carey, gate at Park	45 00
"	Matthew Cook, fireman at Park	44 00
"	W. H. Todd, weigher at Park	28 00
"	N. Hathaway, carpenter	97 00
"	E. B. Carpenter, stairs at Park	24 00
"	John Hay, Assistant Marshal and Superintendent.	60 00
	J. H. Wolf, superintendent of vegetable department	32 00
	A. Hunt, carpenter at Park	24 00
"	A. Hunt, police at Park	20 00
"	Lopez Maulden, ticket clerk	30 00
"	A. H. Estell, assistant entry clerk and clerk of the course	75 00
"	J. D. Crowley, balance account as carpenter at Park	117 00
"	Thos. T. Anderson, police at Park	24 00
"	Robertson & Co., rent of show case	7 00
"	Sacramento *Union*, advertising	55 00
"	Wm. Ainsworth, labor at Park	92 75
"	Geo. Wentworth, police at Park	2 00
"	Henry Ramsey, labor at Park	94 00
"	Samuel Blair, engineer	70 00
"	G. W. Whitlock, decorating hall	62 00

Date.	On what account.	Amount.
Sept. 24...	John F. Wall, drayage	$28 00
"	F. M. Marshal, police	20 00
"	Mrs. Rebecca Gibson, chambermaid	15 00
"	W. L. Newell, ticket clerk at Park	45 00
"	A. Humrich, carriage hire	4 00
"	Hack hire, per Coleman	7 75
Sept. 24...	Smith & Chapman, premium	120 00
"	Rent of tent	60 00
"	Charles S. Eaton, premium	30 00
"	H. E. Greir, premium	5 00
"	John Studerus, premium	3 00
"	Insurance on grand stand	112 50
"	Enoch Dole, police	30 00
Sept. 26...	S. Briggs, police at Park	12 00
"	W. A. Gett, labor at Park	48 00
"	E. F. Goodspeed, police at Park	15 00
"	Pat McGlaughlin, labor at Park	36 00
"	Albert Johnson, labor at Park	70 50
"	Carlos Morino, labor at Park	54 00
"	William Griggs, labor at Park	75 25
"	P. McGowan, labor at Park	12 00
"	Hiram Clock, labor at Park	75 00
"	A. Grubbs, hauling chairs	15 00
"	H. O'Mara, labor at Park	12 00
"	Joseph Menses, labor at Park	49 50
"	R. B. Patton, salary to 21st instant	57 50
"	R. M. Sparks, premium	115 00
"	George Mee, hauling matting	3 00
"	W. H. Sparks, stairs	12 00
"	Isaac Allen, straw	199 53
"	Miss E. S. Wells, rent of show case	5 00
"	William Allen, news stand	24 00
"	Norton Bush, premium	130 00
"	F. M. Chapman, livery bill	45 00
"	Samuel Drummond, cleaning stand	12 00
"	A. Leaman, hay and straw	12 35
"	J. W. Coleman, chief ticket clerk	45 00
"	J. Oscher, water tubs at Park	60 00
"	Capital Woolen Mills, premium	85 00
"	Thomas May, drayage and freight	26 85
"	Daily *Record*, advertising, etc	66 50
"	Ben. Bullard, finance clerk	45 00
"	Jas. Roberts, premium	40 00
"	John A. Todd, lumber at Park	58 44
"	David Bush, bill for Park	467 27
"	David Bush, bill for Pavilion	157 44
"	David Bush, premium	10 00
"	P. A. Miller, setting scales	60 00
"	R. S. Carey, services as President	1,000 00
"	N. L. Drew & Co., lumber account	1,250 00

Date.	On what account.	Amount.
Sept. 26...	Frank Foster, bills	$42 50
"	Frank Foster, premium	5 00
"	Donnely and Parker, lighting gas	24 00
"	Peter Burns, premium	55 00
"	John Tooney, hack hire	3 00
"	William Schink, premium	5 00
"	J. H. Cooper, carpenter at Pavilion	34 00
"	M. Kraker, premium	45 00
"	Spurgeon and Wood, hack hire	24 00
"	Chas. L. Knowles, carpenter	85 00
"	Chas. L. Knowles, Superintendent lower hall	70 00
"	Mrs. H. M. Richards, premium	5 00
"	C. H. Krebs, bill	99 28
"	C. H. Krebs, premium	5 00
"	James McGuire, bill at Park	44 50
"	John Isaac, police	30 00
"	Laufkotter Bros. and Churchman	30 00
"	Rob't Beck, clerical hire and writing up annual report	1,000 00
Sept. 29...	Robert Beck, salary for September	166 66
"	Expense per bill	12 00
"	Lewis Whiting, porter	30 00
"	P. Costello, police	12 00
"	Hamberger & Co., bill	52 43
"	E. Parsons, labor at Park	30 00
"	P. M. Chatterton, balance of carpenter work at Park	287 50
"	Keller & Co., premium	10 00
"	Mrs. R. W. Murphy, premium	40 00
"	E. F. Aiken, premium	95 00
Sept. 30...	D. H. Quinn, premium	30 00
"	W. P. Coleman, insurance	112 50
"	Huntington, Hopkins & Co., bill	31 86
"	Sundry newspapers, advertising bills	248 50
Oct. 4......	N. Clark, premium	18 00
"	G. W. Mayberry, balance of carpenter work at Park	124 00
"	G. W. Mayberry, balance of carpenter work at Pavilion	62 00
"	W. Prader, labor at Pavilion	54 00
Oct. 6......	C. W. Reed, premium	40 00
"	John Breuner, rent of chairs at Park	137 25
"	John Breuner, rent of chairs and tables at Pavilion	46 00
"	John Breuner, premium	110 00
"	Landrum & Rogers, premium	75 00
"	H. M. Kenny, lumber	20 00
"	C. O. Burton, freight on tent	11 00
"	J. H. Jackson, premium	35 00
"	D. Gardner, wood bill	55 25

Date.	On what account.	Amount.
Oct. 6......	Mrs. E. Freik, premium	$10 00
"	Jesse Slaughter, bill for cleaning windows and whitewashing	44 50
"	William Griggs, balance of labor at Pavilion	10 75
"	Whittier, Fuller & Co., bill	11 75
"	Premiums paid by R. T. Brown at Park	2,815 00
"	Purses and entrance to purse No. 5	14,200 00
"	Mrs. Kronkite, premium	40 00
"	Ice Company, bill	5 90
"	R. T. Brown, services as Treasurer	250 00
"	Will. Dunlevy, errand boy	6 00
"	Hall's Safe and Lock Co., premium	20 00
"	Wm. Crump, watchman at Pavilion	32 00
"	J. C. Carroll & Co., bill of feed	160 63
"	August Weiss, team work at Park	105 00
"	Labor at Park	94 50
"	Labor at Pavilion	12 00
"	John Hyde, labor at Park	3 75
"	A. Weiss, gate and stairs at Park	30 00
"	H. S. Crocker & Co., bill	628 14
"	Dale & Co., premium	15 00
"	Bill	2 00
"	Meusdorffer & Co., premium	5 00
"	Amador *Ledger*, advertising	10 00
"	Visalia *Delta*, advertising	15 00
"	Vallejo *Chronicle*, advertising	12 00
"	Post Office, box rent	4 00
Oct. 10....	J. W. M. Smith, painting bill	52 40
"	J. C. Devine & Bro., premium	20 00
"	Phil. Cohn, glazing bill	14 75
"	Billingsley & Foster, bill	3 50
"	S. J. Nathan, premium	10 00
Oct. 11....	Mrs. Byers, premium	5 00
"	Joseph Bauquier, two stalls	15 00
"	H. M. Bernard, bill	22 50
"	R. C. Terry & Co., bill	17 00
"	G. W. Swinerton, bill	2 50
"	B. R. Sweetland, bill	1 25
"	J. R. Johnson, bill	4 50
"	H. A. Weaver & Co., bill	45 00
"	J. R. Ray, bill	10 00
"	James M. Calvins, bill	3 00
"	F. A. Michner, bill	21 91
"	H. T. Holmes & Co., bill	9 75
"	Stockton *Independent*, advertising	15 00
"	Mrs. Van Heusen, premium	15 00
"	Mad. A. G. Lucas, premium	20 00
"	San Francisco Glass Works, premium	10 00
"	Mrs. Cotter, premium	20 00
"	F. Swift, errand boy	6 00

Date.	On what account.	Amount.
Oct. 11....	San Francisco Brush Factory, premium.............	$5 00
"	Thompson & Gregory, sawdust...........................	5 50
"	F. Jay Lewis, filling diplomas...........................	15 00
"	N. L. Drew & Co., balance of lumber at Park.....	1,137 91
"	N. L. Drew & Co., balance of lumber at Pavilion...	172 56
Oct. 13....	R. J. Merkley, premium..	5 00
Oct. 20....	F. J. Lewis, filling diplomas..............................	16 00
"	Robert Williamson, premium................................	29 00
"	Mrs. J. Sims, premium...	5 00
"	Hartwell, Hotchkiss & Stalker, bill...................	284 76
"	Mrs. M. Cargill, premium......................................	6 00
Oct. 21....	Mrs. Kuhl, premium	5 00
"	Mrs. Mebius, premium..	5 00
"	S. H. Davis, bill at Park.......................................	253 98
"	S. H. Davis, bill at Pavilion.................................	42 26
"	S. Wilzinski, premium..	15 00
Oct. 22....	Mrs. W. E. Miller, premium..................................	5 00
Oct. 23....	Fairbanks, Hutchinson & Co., hayscales............	300 00
"	Fairbanks, Hutchinson & Co., premium..............	25 00
"	W. R. Strong, premium........	5 00
"	Mrs. Hayden, premium...	10 00
"	Mrs. F. W. Rinehart, premium..............................	5 00
"	F. Jay Lewis, premium..	10 00
Oct. 25....	Barnes & Barber, bill..	5 00
"	Mrs. Stovall, premium........	5 00
"	Mrs. Molly Hahn, premium....................................	5 00
"	S. Lipman & Co., bill...	3 75
"	P. Burns, premium...	15 00
Oct. 27....	Thomas Orchard, premium.........	5 00
"	Mrs. Corbusier, premium......................................	5 00
Oct. 28....	Mrs. Blackleach, bill...	16 00
Oct. 29....	J. J. Gleason, bill..	21 24
"	H. Wachhorst, bill...	15 00
"	Laufkotter Bros. & Co., premium.........................	20 00
"	A. Markewitz, premium...	3 00
Oct. 30....	R. Rose, premium...	10 00
Nov. 1.....	Mrs. Otes, premium...	5 00
"	Mrs. J. R. Wilkinson, premium..............................	5 00
"	Miss J. M. Peirce, premium..................................	13 00
"	W. Landerkin, premium...	5 00
Nov. 3.....	W. J. Prather, premium...	20 00
"	S. F. Hyde, exit gate-keeper.................................	30 00
"	Mrs. Morehead, premium.......................................	5 00
"	John Smith, premium..........	3 00
Nov. 5.....	B. Dennery, bill...........................	31 40
"	Mrs. Lansing, premium...	10 00
"	Joseph Hill, premium.............................	15 00
"	Mrs. Crokite, premium..	5 00
"	R. C. Terry, premium..	68 00
Nov. 12. .	Huntington, Hopkins & Co., premium.................	52 00

Date.	On what account.	Amount.
Nov. 13...	Robert Beck, salary, October..............................	$166 66
Nov. 22...	Mrs. Cotter, premium...	10 00
"	T. J. Handley, brick..	10 00
"	Edward Short, hack hire..	2 50
"	Sacramento Gas Company, bill.............................	284 60
"	R. H. Pettit, bill...	22 50
Nov. 29...	William Guttenberg, premium.............................	10 00
"	D. M. Reavis, premium..	85 00
"	City Guards, connecting pipe................................	2 50
Dec. 1.....	Mrs. L. Bruckerman, premium.............................	3 00
"	Robert Beck, salary, November.............................	166 66
Dec. 2.....	George W. Mayberry, labor.........	16 25
"	Expense, bill filed..	14 90
"	J. E. J. Hows, labor..	12 50
Dec. 6.....	J. Brizee, premium..	5 00
"	Insurance on new stand.......................................	120 00
Dec. 16...	Baker & Hamilton, bill filed..................................	64 00
"	H. M. Bernard, bill filed..	2 50
Dec. 20...	Carl & Croly, bill, office repairs...........................	353 30
"	Nash, Miller & Co., premium................................	5 00
Dec. 23...	A. Hathaway, cleaning carpet..............................	6 30
"	C. C. Baker, premium..	145 00
Dec. 24...	W. C. Alsop, setting out trees.	25 00
Dec. 26...	S. Cole, premium...	35 00
"	George H. Baker, diplomas....................................	62 50
Dec. 31...	Robert Beck, salary for December.......................	166 66
"	Pacific Ice Company, ice.......................................	28 45
"	Expense, bill filed..	24 70
1874.		
Jan. 3......	Mrs. M. Wilson, premium......................................	2 00
"	San José Woolen Mills, premium..........................	5 00
"	Tax on eight lots bought of F. S. George...........	27 00
"	Tax on one lot bought of Sacramento Railroad Company..	2 85
Jan. 5......	Medals and silverware, per bill of Vanderslice & Co.	712 28
"	Whittier, Fuller & Co., diploma frames...............	124 00
"	A. A. Wood, alfalfa seed..	135 00
"	R. C. Terry & Co., bill...	5 00
"	A. A. Wood, bill...	397 84
"	F. Jay Lewis, filling diplomas...............................	9 00
"	C. H. Krebs, bill, Park.................................	16 45
"	C. H. Krebs, bill, Pavilion.....................................	250 95
"	Huntington, Hopkins & Co....................................	1 50
"	R. C. Terry & Co..	4 00
"	Discount on State warrant....................................	152 10
	Total	$51,462 04

RECAPITULATION.

Expenditures for the year eighteen hundred and seventy-three.

Bills and premiums for 1872	$2,816 71
Labor, real estate, and material for improvements	10,249 25
Premiums of 1873	8,782 00
Purses to races in 1873	14,200 00
Purses to regatta in 1873	445 00
Repairs of Secretary's office	684 95
Current expenses for 1873	14,284 13
Total	$51,462 04

CONSTITUTION

OF THE

STATE AGRICULTURAL SOCIETY.

CONSTITUTION

OF THE

CALIFORNIA STATE AGRICULTURAL SOCIETY.

ARTICLE I.—NAME.

SECTION 1. This society shall be called "The California State Agricultural Society."

ARTICLE II.—OBJECT.

SECTION 1. It shall be the object of this society to encourage the cultivation of the soil and the general development of all the agricultural resources of this State.

SEC. 2. To foster every branch of mechanical and household arts calculated to increase the happiness of home life.

SEC. 3. To extend and facilitate the various branches of mining and mining interest.

ARTICLE III.—MEMBERSHIP.

SECTION 1. *Annual Members.*—Any person who has, during the year eighteen hundred and sixty-five, or who shall, during this year or any subsequent one, pay into the funds of this society the sum of five dollars, may become a member of the same; such membership to expire on the thirty-first day of the following December.

SEC. 2. *Life Members.*—Any person may become a member for life by the payment of fifty dollars; or, if already a member, by the payment of forty dollars, and shall thereafter be exempt from all dues and assessments.

SEC. 3. *Honorary and Corresponding Members.*—Any person whom the Board shall propose may be elected an honorary or a corresponding member, and shall enjoy, free of charge, all the privileges of the society, except voting and holding office.

SEC. 4. *Privileges of Members.*—Any citizen of this State, being a member of this society, shall be eligible to office, entitled to vote, and enjoy the free use of the library, under the rules of the same, and have free admission, accompanied by his wife and minor children, to all the exhibitions of the society, and shall be permitted to compete for premiums in any or all departments.

SEC. 5. *Expulsion of Members.*—Any member who shall present for exhibition any article or animal which he is not entitled by the rules of the society to exhibit, or who shall attempt to deceive, or be guilty of a breach of good faith toward the society, may be expelled by a vote of two thirds of the members present at any meeting of the society; *provided*, always, that no member shall be expelled unless written notice of the alleged offense shall have been served on him, or left at his usual place of residence at least twenty days previous to the action.

ARTICLE IV.—OFFICERS.

SECTION 1. The officers of this society shall consist of a President and nine Directors, who shall constitute a State Board of Agriculture, five of whom shall constitute a quorum. They shall elect a Treasurer and Secretary, not members of the Board. They may also appoint annually, as officers of the Board, a chemist, a botanist, a meteorologist, a geologist, a metallurgist, an ornithologist, and an entomologist, and define the duties of each. They may appoint such committees on the various departments of agriculture, mining, and manufactures, either generally or for specific purposes, as they may deem important for the best interests of the State, and require such committees to report the results of their investigations to the Board at such times as may be named by them.

SEC. 2. *Duties of President.*—The President shall preside at all meetings of the Board, and of the society; shall have power to call special meetings of the Board when necessary, and at the written request of ten members, may call extra meetings of the society; shall appoint all meetings not otherwise provided for; shall vote only at the election of officers, and in case of a tie; and shall sign all financial and official documents emanating from the society not otherwise provided for. In the absence of the President from any meeting of the Board or society, any Director may be called to the chair, and during such meeting, and for the completion of any business transacted or ordered at the same, shall have the same powers as the President.

SEC. 3. *Duties of Secretary.*—The Secretary shall conduct the correspondence of the society, keeping in a separate book copies of all letters written in the name or on behalf of the society, holding the same free to the inspection of any member of the society, at any regular meeting of the same. He shall also receive and file all letters addressed to the society, holding the same subject to the Board of Directors. He shall attend all meetings of the society and the Board, keeping a full record of the doings of each in a separate book, and shall furnish a copy of the proceedings of each meeting to the Committee on Publication within five days after the close of such meeting. He shall prepare and publish all notices of meetings, shall keep a roll of all standing committees, and call the same (noticing absences) whenever desired to do so by the Chair; shall sign all certificates of honorary and corresponding memberships, and forward the same to those entitled to receive them. He shall keep, in a book prepared for that especial purpose, the name and address of every member; shall prepare and sign all gratuitous or complimentary cards or tickets of admission; shall countersign all diplomas, certificates of merit, etc., awarded by the society, and forward the same to their respective

claimants. He shall be ex officio Librarian; shall keep the seal, and all the plates, dies, engravings, etc., belonging to the society, and shall cause to be struck therefrom such medals and impressions as may from time to time be required. He shall have charge of all specimens, models, plants, seeds, books, etc., and arrange, prepare, or distribute the same under the direction of the Board. He shall prepare all reports to be made by the Board to the society, and all reports to be made by the society to the State. He shall receive all moneys due or payable to the society, and pay the same to the Treasurer, taking his receipt therefor; shall hold all bonds filed by officers of the society for the faithful performance of their duty, and all vouchers for every class of expenditure. He shall countersign all drafts ordered by the Board, and all certificates of annual and life membership, and keep an account of the same, in a separate book, as they are issued, and shall, in December of each year, prepare a tabular statement of the receipts and expenditures of the society, according to the law incorporating the same. For which services he shall receive such compensation as the Board shall decide to pay.

SEC. 4. *Duties of the Treasurer.*—The Treasurer shall receipt for all funds at the hands of the Secretary, and shall disburse the same only on the order of the Board, attested by the President and the Secretary. He shall also hold in trust all certificates of stock, bonds, notes, deeds, or other evidences of debt or possession belonging to the society, and shall transfer, invest, or dispose of the same only by direction of the society, or by a written order of the Board. He shall, within ten days after his election, file with the Secretary a bond for the faithful performance of his duties; said bond to be approved by the Board and to be in a sum equal to twice the combined amounts of the funds on hand and the estimated revenue for the year; and shall, at the annual meeting, make to the society a detailed report of all his doings; for which services he shall receive such compensation as the Board shall from time to time decide to pay.

SEC. 5. *Duties of the Board.*—The Board of Managers shall have the general and financial management of all the affairs of the society in the interim of annual meetings. It shall fill all vacancies occurring between elections, and shall make the necessary preparations and arrangements for all meetings, fairs, exhibitions, etc. The Board shall also have power to make its own by-laws (not inconsistent with this Constitution) and arrange the time and place of its own meeting.

ARTICLE V.—STANDING COMMITTEES.

SECTION 1. *Committee of Finance.*—The Committee of Finance shall consist of three (the President and Secretary being two), whose duty it shall be to audit the Treasurer's account, to examine and approve all bills before they are paid, to have general supervision of the finances of the society, and to report their doings in full to the Board whenever called on so to do.

SEC. 2. *Library Committee.*—The Library Committee shall consist of three (the Secretary being one), whose duty it shall be to have the general supervision of the library and cabinet, to make all necessary rules and regulations for the government of the same (said rules and regulations being subject to the approval of the Board), to suggest such means for the safe keeping and enlargement of both the library and cabinet as they may deem expedient, and to make a full report of their doings, together with the state of the department under their charge, at each annual meeting.

SEC. 3. *Visiting Committee.*—The Visiting Committee shall consist of three, whose duty it shall be to visit and examine all farms, orchards, vineyards, nurseries, field crops, mining claims, ditches, mills, etc., which may be entered for competition, and which shall require examination at other times and places than the annual Fair; to award premiums for the same, according to the schedule, and recommend such gratuities as they may deem proper, and make a full report to the Board at least one day previous to the annual meeting.

SEC. 4. *Committee on Publication.*—The Committee on Publication shall consist of three (the President and Secretary being two), whose duty it shall be to contract for and superintend, under the direction of the Board, all printing and publishing necessary for the prosperity of the society.

ARTICLE VI.—DONATIONS AND BEQUESTS.

SECTION 1. All donations, bequests, and legacies to this society, designated by the donors for any particular purpose embraced within the objects of the society, shall be with strict fidelity so applied; and the name of each donor, together with the amount and description of such donation, and the object for which it was designated, shall be registered in a book kept expressly for that purpose.

ARTICLE VII.—MEETINGS AND EXHIBITIONS.

SECTION 1. *Exhibitions.*—The society shall hold an annual Fair and Cattle Show in the City of Sacramento, and may, at its discretion, hold such other exhibitions as it may deem conducive to the interests of agriculture.

SEC. 2. *Annual Meeting.*—The annual meeting shall be held at the Capital of the State, at such time during the month of January in each year as the Board may designate, at which time all the officers from whom reports of the preceding year's service are required shall present the same, and all officers for the ensuing year shall be elected by ballot; and all officers shall continue in office until their successors are duly qualified.

SEC. 3. *Special Meetings, how called.*—No special meeting of the society shall be called but upon thirty days notice in the columns of a newspaper published in each of the Cities of San Francisco, Sacramento, Marysville, and Stockton; nor without a request signed by at least ten members.

SEC. 4. *Proxy Voting.*—It shall not be admissible for any member to vote by proxy in any meeting of this society, or its Board of Managers.

SEC. 5. *Quorum of the Society.*—At any meeting of this society, fifteen members (a majority of whom shall represent counties other than the one where the meeting shall be held) shall constitute a quorum.

ARTICLE IX.—OFFICE AND ROOMS.

SECTION 1. The office, rooms, library, and cabinet of the society shall be permanently located at the Capital of the State.

ARTICLE X.—AMENDMENTS.

SECTION 1. Amendments to this Constitution must be presented in writing at an annual meeting, when, if unanimously agreed to, they shall be adopted; but if there be objection, and a majority consent thereto, they shall be spread upon the minutes and lie over until the next annual meeting, when they shall be read, and if, after due discussion, two thirds of all the members present vote for the amendments, they shall be adopted and become a part and parcel of this Constitution.

ARTICLE XI.—EFFECT.

SECTION 1. This Constitution shall take effect from and after its passage.

I certify the foregoing to be a true copy of the Constitution of the California State Agricultural Society, as amended by unanimous consent at the annual meeting of the society, held on the twenty-eighth day of January, A. D. eighteen hundred and sixty-nine.

I. N. HOAG,
Corresponding Secretary.

COMPILATION OF LAWS

RELATING TO THE

STATE AGRICULTURAL SOCIETY.

A COMPILATION

OF ALL THE LAWS NOW IN FORCE RELATING TO OR AFFECTING THE STATE AGRICULTURAL SOCIETY.

AN ACT

TO INCORPORATE A STATE AGRICULTURAL SOCIETY AND APPROPRIATE MONEY FOR ITS SUPPORT.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

Section 1. There is hereby established and incorporated a society to be known and designated by the name and style of the "California State Agricultural Society," and by that name and style shall have perpetual succession, and shall have power to contract and be contracted with, to sue and be sued, and shall have authority to have and use a common seal, to make, ordain, and establish, and put in execution such by-laws, ordinances, rules, and regulations as shall be necessary for the good government of said society, and the prudent and efficient management of its affairs; *provided*, that said laws, ordinances, rules, and regulations shall not be contrary to any provision of this charter, nor the laws and Constitution of this State or of the United States.

Sec. 2. In addition to the powers above enumerated, the society shall, by its name aforesaid, have power to purchase and hold any quantity of land not exceeding four sections, and may sell and dispose of the same at pleasure. The said real estate shall be held by said society for the sole purpose of establishing a model experimental farm or farms, erecting inclosures, buildings, and other improvements calculated and designed for the meeting of the society, and for an exhibition of the various breeds of horses, cattle, mules, and other stock, and of agricultural, mechanical, and domestic manufactures and productions, and for no other purposes.

And be it further enacted, That if, from any cause, said society shall ever be dissolved, or fail to meet within the period of two consecutive years, then the real estate held by it, together with all the buildings and appurtenances belonging to said estate, shall be sold as lands are now sold by execution, and the proceeds deposited in the State Treasury, subject to the control of the Legislature.

AN ACT

SUPPLEMENTAL TO AN ACT TO INCORPORATE A STATE AGRICULTURAL SOCIETY, APPROVED MAY THIRTEENTH, EIGHTEEN HUNDRED AND FIFTY-FOUR, AND AMENDED MARCH TWENTIETH, EIGHTEEN HUNDRED AND FIFTY-EIGHT.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. The general prudential and financial affairs of the society shall be intrusted to a Board of Agriculture, to consist of a President and nine Directors, five of whom shall constitute a quorum.

[Amended section.]

SEC. 2. Said Board of Agriculture shall be elected at a general State Agricultural Convention, to be held at the Capital of the State, in the year eighteen hundred and sixty-three, in the month of March, and in the month of January every year thereafter, to consist of the life members and annual members of the State Agricultural Society and four delegates from each County Agricultural Society within this State, incorporated under the general laws of this State for such corporations, and an equal number from each District Agricultural Society, also incorporated under the general laws of this State for such purposes; said delegates to be chosen at the annual Fair or annual meeting of each such society next preceding the State Agricultural Convention; *provided*, said Convention to be held in March, in the year eighteen hundred and sixty-three, may admit any person or persons representing any of said County or District Agricultural Societies, as the Convention may determine by a majority vote, whether such persons shall have been elected by their respective County or District Societies, as provided in this Act, or not.

SEC. 3. The Board of Agriculture shall, at its first meeting after its election, be divided by lot into three equal portions (omitting the President), one portion to continue in office one year, one portion two years, and one portion three years; one third of the number, together with the President, to be elected at the State Agricultural Convention annually thereafter; the Directors to hold office three years.

SEC. 4. The Board of Agriculture may, in the absence of the President, choose one of its other members temporary Chairman. They shall elect a Treasurer and Secretary, not members of the Board, prescribe their duties, fix their pay; and the said Treasurer and Secretary shall be subject to removal at any time by a majority of said Board.

SEC. 5. The Board of Agriculture shall use all suitable means to collect and diffuse all classes of information calculated to aid in the development of the agricultural, stock raising, mineral, mechanical, and manufacturing resources of the State; shall hold an annual exhibition of the industry and products of the State; and, on or before the first day of January of each year in which the Legislature shall be in regular session, they shall furnish to the Governor a full and detailed account of all its transactions, including all the facts elicited, statistics collected, and information gained on the subject for which it exists; and also a distinct financial account of all funds received, from whatever source, and of every expenditure, for whatever purpose, together with such suggestions as experience and good policy shall dictate for the advancement of the best interests of the State; the said reports to be treated as other State documents are.

SEC. 6. The Board of Agriculture shall have power to appoint a suitable number of persons to act as Marshals, who shall be, from twelve o'clock, noon, of the day previous to the opening of the exhibition until noon of the day after the close of the same, vested with all the powers and prerogatives with which Constables are invested, so far as acts or offenses committed within, or with reference to, or in connection with, the exhibition are concerned.

SEC. 7. The Board of Agriculture may, in its discretion, award premiums for the best cultivated farms, orchards, vineyards, gardens, etc.; *provided*, that said Board shall not audit, allow, or pay an amount exceeding one thousand dollars in any one year for traveling expenses of Visiting Committees in examining said farms, et cetæra; *provided* further, that no person except practical agriculturists shall be appointed on said committees.

SEC. 8. It shall be optional with any to whom a premium is awarded to receive the article named or its equivalent (as affixed) in coin.

SEC. 9. The State Agricultural Society shall have power, at its first annual meeting after the passage of this Act, to make such alterations in its Constitution as shall make it conform to the provisions of this Act.

SEC. 10. All Acts or provisions in conflict with the provisions of this Act are hereby repealed.

SEC. 11. This Act shall take effect from and after its passage.

AN ACT

FOR THE ENCOURAGEMENT OF AGRICULTURE AND OTHER INDUSTRIES, APPROVED MARCH TWENTY-FIRST, EIGHTEEN HUNDRED AND SEVENTY-TWO.

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. There is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of five thousand dollars for the State Agricultural Society, the sum of three thousand dollars for the Bay District Agricultural Society, and the sum of two thousand dollars for each of the following named societies, viz: the Los Angeles District Agricultural Association, the Santa Clara Valley Agricultural Society, the Sonoma and Marin District Agricultural Society, the San Joaquin Valley District Agricultural Society, the Northern District Agricultural, Horticultural, and Mechanical Society, the Upper Sacramento Agricultural Society, the Siskiyou County Agricultural Society, and the Bay District Horticultural Society, and the California Vine Growers' and Wine and Brandy Manufacturers' Association, for each of the years eighteen hundred and seventy-two and eighteen hundred and seventy-three. Upon presentation of the requisition of the President and Secretary of either of the societies above named to the State Controller, the Controller shall draw his warrant on the Treasurer in favor of such society for the amount appropriated to such society, and the Treasurer shall pay the same. The money so drawn by each society shall be used for the purpose of paying premiums for the various agricultural, mineral, mechanical, and manufacturing products of this State, and for no other purpose.

SEC. 2. The Directors of each of the above named societies, except the State Agricultural Society, shall each year report to the State Board of Agriculture the name and Post Office address of each of the officers of such society, on or before the first day of May; and on or before the first day of December of each year they shall report to said Board of Agriculture the transactions of said society, including the list of articles exhibited and premiums awarded; the amount of receipts and expenditures of the year, and the objects for which the expenditures have been made; the new industries inaugurated and new products produced, and any and all other facts showing the development of the resources of the district embraced in such society, which they may deem worthy of such report.

SEC. 3. The State Board of Agriculture shall report annually, on or before the fifteenth day of January, to the Governor of the State, the full transactions of the State Society, including the facts and statistics collected and information gained on the subjects for which it exists; also including the report from each of the above named societies, or so much thereof as said Board may deem of value for publication.

SEC. 4. The Governor shall cause five thousand volumes of said report of the State Board of Agriculture to be printed each year, at the expense of the State, and paid for as other public printing, and delivered to the State Agricultural Society for general distribution.

SEC. 5. All laws or parts of laws conflicting with the provisions of this Act are hereby repealed.

SEC. 6. This Act shall take effect and be in force from and after its passage.

PLANTING SHADE TREES.

To give the following law as much prominence as possible, and at the same time give the efforts made by the Board to give it life and form, the following circular is introduced here. It was sent, as indicated, to all the Boards of Supervisors and the press, and many private individuals of public spirit:

ROOMS CALIFORNIA STATE BOARD OF AGRICULTURE,
SACRAMENTO, October 20th, 1872.

To the Board of Supervisors of the County of ———:

GENTLEMEN: I am directed by the State Board of Agriculture to call your attention to an Act to encourage the planting and cultivation of shade and fruit trees upon the public roads and highways of this State, approved March thirtieth, eighteen hundred and sixty-eight. The following is a true copy of the Act referred to:

AN ACT

TO ENCOURAGE THE PLANTING AND CULTIVATION OF SHADE AND FRUIT TREES UPON THE PUBLIC ROADS AND HIGHWAYS OF THIS STATE.

[Approved March 30th, 1868.]

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. The Board of Supervisors of any county of this State may, by an order of such Board, to be passed at a regular meeting of such Board and to be entered in the minutes thereof, authorize the planting and cultivation of shade and fruit trees, by persons owning lands in such county, upon the public roads and highways adjacent to such lands.

SEC. 2. The Board of Supervisors may, by order entered upon their minutes, designate the roads or highways upon which such trees may be planted, so describing such road, by reference to places and boundaries, that the same may be readily ascertained. They shall also, in such order, direct the species of trees to be so planted, their age when planted, their distance from each other, and their position with reference to the traveled road, and also all such other rules and regulations as they shall deem proper to secure the proper planting, growth, and protection of such trees, and also to prevent their obstructing the travel upon such road.

SEC. 3. Whenever any person shall plant, upon any public road, in front of land owned by him, shade or fruit trees, in accordance with the provisions of this Act, and also of such rules as the Board of Supervisors may prescribe hereunder, such person so planting such trees shall file with the Board of Supervisors of such county a written statement, setting forth therein the road or places upon which such trees are planted, the number and species of trees thus planted, and the time of planting.

SEC. 4. Four years from and after the date of planting such trees and giving the notice as provided in section third, the person planting such trees, or his legal representative, may present to the Board of Supervisors of such county his statement in writing, verified by the oath of such applicant, setting forth therein the number and species of trees originally planted, when and by whom planted or caused to be planted, and the number then living and in a thrifty condition; and for any willful misstatement contained in such report the party making the same may be prosecuted for the crime of perjury.

SEC. 5. Upon filing such verified statement, the Board of Supervisors of such county shall allow to the party making the same the sum of one dollar for each and every tree so planted and growing thriftily, the same to be audited and paid out of the General Fund of such county as other claims are allowed, audited, and paid.

SEC. 6. Nothing contained in this Act shall be construed to apply to any trees planted before the passage of this Act, or unless planted and cultivated as required by the orders of the Boards of Supervisors.

SEC. 7. This Act shall be in force from and after its passage.

You will see by the above that you are authorized by the Legislature to encourage the planting of trees on either side of every public road in your county. In the opinion of the Board, you could perform no act likely to result in such undoubted and general benefit to your county and people as the placing upon your records the proper orders for carrying into effect the provisions of the above law. We could name many reasons in favor of your action in this respect, but we do not deem it necessary. These reasons will occur to every intelligent mind, and we trust will secure your early and favorable action, so that the tree planting may be initiated and executed to a considerable extent during the approaching planting season. We would suggest, however, that no trees be allowed to be planted nearer than twelve feet from each other; that trees between three and eight years from the seed would be preferable as to age, and would recommend the following varieties as hardy, of rapid growth, and many of them valuable for wood or timber:

Black and Honey Locusts; Black, White, and Fruiting Mulberry; Osage Orange, Native and Eastern Black Walnut; American Chestnut; European, American, and Cork Bark Elm; the different kinds of Maple; the Tulip Tree; Carolina, Lombardy, and Silver Leaf Poplar; different kinds of Ash; the Apple, Pear, Plum, Cherry, Almond, and Fig, Eucalyptus, or Australian Blue and Red Gum; Monterey Pine, Sugar Pine, Yellow Pine, Spruce Pine, Norway Spruce, Balsam Fir, Scotch Pine, European Larch, Monterey Cypress, Italian Cypress, California Redwood, California Laurel, and such other kinds as your Board may deem of value for your county.

Hoping you will take early and favorable action in this important matter, we are, respectfully, etc., by order of the Board,

ROBT. BECK, Secretary.

ANIMALS EXHIBITED AT THE PARK.

ANIMALS EXHIBITED AT THE PARK.

THOROUGHBRED HORSES.

STALLIONS.

Best Stallions four years old and over.

Theodore Winters, Washoe City and Davisville—Norfolk, by Lexington; dam, Novice, by imported Glencoe.

John Hall, Alvarado—Woodburn, by Lexington; dam, Heads-I-Say, by imported Glencoe. Ironclad, by Woodburn; dam, Peggy Ringgold.

James Mee, San Francisco—Norfall, by Norfolk; dam, Moss Rose, by imported Knight of St. George.

J. M. Dickerson, San Francisco—Monday, by Colton; dam, Mollie Jackson.

George Treat, San Francisco—Mark Livingston, by Norfolk; dam, Virginia, by Revenue.

George A. Johnson, San Diego—Phil. Sheridan, by Norfolk; dam, Bonnie Belle, by Belmont.

Best three years old.

John Hall, Alvarado—Darley, by Woodburn; dam, Peggy Ringgold.

James Mee, San Francisco—Chief Crowley, by Woodburn; dam, Bonnie Belle.

Best two years old.

Theodore Winters, Davisville—Waterford, by Langford; dam, Margarita, by Lexington.

John Hall, Alvarado—Thornwood, by Woodburn; dam, Viola, by imported Knight of St. George.

James Mee, San Francisco—Tommy, by Woodburn; dam, Peggy Ringgold, by Ringgold.

John Funck, Kern County—General Beal, by Norfolk; dam, Susie Moore; grand dam, Susie Hawkins.

James Mee, San Francisco—Aureola, by Young Eclipse; dam, Milly, by Slasher.

Best one year old.

Theodore Winters, Davisville—Cestos, by Norfolk; dam, Margarita, by Lexington.

L. M. Darling, San Francisco—Billy, by Norfolk; dam, Julia, by imported Nena Sahib.

Wilbur Peirce, Alameda—Joe Hooker, by Monday; dam, Mayflower, by imported Eclipse.

J. A. Hutton, Woodland—Orestes, by imported Hercules; dam, Lily Dale, by Owen Dale.

Wm. Boots, San José—Nathan Coombs, by Lodi; dam, Miami.

Best colt under one year.

Jas. Mee, San Francisco—Orient, by Monday; dam, Mayflower, by imported Eclipse.

Wm. Boots, San José—Robt. Wooding, by Hercules; dam, Miami. No Name, by Hercules; dam, Lizzie Marshall.

MARES.

Best four years old and over, with colt.

John Hall, Alvarado—Moss Rose and colt; Moss Rose, by imported Knight of St. George; dam, by imported Melrose.

Jas. Mee, San Francisco—Mayflower and colt; Mayflower, by imported Eclipse; dam, Hennie Farrow.

Theo. Winters, Davisville—Hennie Farrow and colt; Hennie Farrow, by imported Shamrock; dam, by imported Belshazzar.

Wm. Boots, San José—Miami and colt; Miami, by Belmont; dam, Maria Downing, out of an American Eclipse mare. Lizzie Marshall and colt; Lizzie Marshall, by Lodi; dam, Ellen Jordan, by Black Nose.

Best four years old mare and over.

John Hall, Alvarado—Peggy Ringgold, by Ringgold; dam, Peggy, by Cripple.

Jas. Mee, San Francisco—Abi, by Woodburn; dam, Peggy Ringgold. Lady Jane, by Marauder; dam, Jane Shore.

Dr. Carpenter, San Francisco—Alice Douglas, by imported Lawyer; dam, Fanny Frazer.

J. A. Hutton, Woodland—Lily Dale, by Owen Dale; dam, a Jack Hawkins mare.

Henry Williamson, Sherman Island—Mary Chilton, by imported Glencoe; dam, an American Eclipse mare.

N. W. Randall, Stockton—Carrie Miller, by Veto; dam, Fanny Howard, by Illinois Medoc.

Best three years old.

John Hall, Alvarado—Lady Franklin Second, by Woodburn; dam, Lady Franklin, by imported Lawyer.

Best two years old.

No entry.

Best one year old.

John Hall, Alvarado—Lady Washington, by Woodburn; dam, Peggy Ringgold.

H. Williamson, Sherman Island—Abbie, by Don Victor; dam, Mary Chilton, by imported Glencoe.

Best mare colt under one year.

Theodore Winters, Davisville—Mollie McCarthy, by Monday; dam, Hennie Farrow.

John Hall, Alvarado—Rosewood, by Woodburn; dam, Moss Rose.

FAMILIES.

Best thoroughbred sire with ten of his colts, all thoroughbreds.

Theodore Winters, Davisville—Norfolk and ten colts.

John Hall, Alvarado—Woodburn and ten colts.

Best thoroughbred dam with not less than four of her colts, all thoroughbred.

John Hall, Alvarado—Peggy Ringgold and four colts.

FAMILIES.

Best stallion, other than thoroughbred, with not less than ten of his colts.

Joshua Reeves, Lincoln, Placer County—Vibrator and ten colts.

John H. Jackson, Cacheville, Yolo—Black Buck and ten colts.

William Hamilton, San Jose—Ethan Allen, Jr., and ten colts.

L. H. Fasset, Sacramento County—Nelson, Jr., and ten colts.

Best dam, other than thoroughbred, with not less than three of her colts.

Daniel Flint, Sacramento—Nellie Bly and three colts.

E. Pierce, Sacramento—Nellie Morgan and four colts.

Joshua Reeves, Lincoln—Nellie and four colts.

John H. Jackson, Cacheville—Fly and three colts.

William Hamilton, San Jose—Winona and colts.

William Hamilton, San Jose—Santa Clara and colts.

J. A. Hutton, Woodland—Molly Dale and colts.

GRADED HORSES.

Best stallion, four years and over.

Thomas Edwards, Sacramento—Phil. Sheridan.

P. F. Mangin, Sacramento—St. Patrick.

L. M. Darling, San Francisco—Mark Moore.

William Hamilton, San José—Ethan Allen, Jr.

C. P. Marsh, Oakland—High Die.

G. S. Brown, Sacramento—Richmond.

Best three years old.

Wilbur Pierce, Alameda—Allanzo.

Best two years old.

C. Barney, Yolo—Young Langford.

Best one year old.

William Hamilton, San José—Frank Malone.

Best colt.

No entry.

Best mare, four years old and over, with colt.

Charles H. Shear, Sacramento—Alicia Mandeville and colt.
Jas. Mee, San Francisco—Lady Belle and colt.
Jas. Mee, San Francisco—Cayuga Maid and colt.
Jas. Mee, San Francisco—Fashion and colt.
William Hamilton, San José—Santa Clara and colt.
P. F. Mangin, Sacramento—Lady DuBoice and colt.

Best four years old mare.

James Mee, San Francisco—McCabe.
William Hamilton, San José—Winona.
C. Barney, Yolo—Nettie Read.

Best three years old.

No entry.

Best two years old.

J. J. Smith, Yolo—Leontine.
William Hamilton, San José—Susie.

Best one year old.

James Mee, San Francisco—Baby Belle.
William Hamilton, San José—Emma.

HORSES OF ALL WORK.

STALLIONS.

Best four years old or over.

A. G. Butler, Hicksville—Young Wallace.
Joshua Reeves, Lincoln—Vibrator.
R. A. Bromton, Dixon—Tickle-my-Fancy.
P. M. Warn, Sacramento—Morgan coach horse.
James Clark, Colusa—Messenger Boy.
M. L. Britton, Redwood City—Don Juan.
Charles Wentzel, Oakville, Napa—Juno.

Best three years old.

James Clark (for Hartley, Colusa)—Green Mountain Chief.

Best two years old.

John Speaker, Lincoln, Placer—Alexander.
Tunis Vanvechten, Lincoln, Placer—Major Beck.
Louis Williams, El Dorado—Random.
Joshua Fountain, Sacramento—Printer.
Joshua Fountain, Sacramento—Shakespeare.
E. Blanchard, San Mateo—Uncle Sam.
William Hamilton, San José—Justice.
Joseph Bauquier, Sacramento—Odd Fellow.

Best one year old.

Joshua Reeves, Lincoln—Ben Franklin.
Dr. B. J. Smith, San Francisco—Henry Ward Beecher.

MARES.

Best four years old or over.

Michael Nicholson, San José—Kate.
John H. Jackson, Cacheville—Seal.
Robert Williamson, Sacramento—Belle.
Joseph Bauquier, Sacramento—Fan.
Joseph Bauquier, Sacramento—Bet.
A. D. Miller, Sacramento—Lady Miller.

Best four years old, with colt.

E. Pierce, Sacramento—Nellie Morgan and colt.
John Kennedy, Sacramento—Carrie and colt.
J. C. Gould, San José—Liz and colt.

Best three years old.

Michael Nicholson, San José—Flora.
E. Pierce, Sacramento—Sallie Moore.
John H. Jackson, Cacheville—Black Maria.

Best two years old.

E. Pierce, Sacramento—Lady Moore.
A. H. Nixon, Yolo—Hattie Hicks.
John H. Jackson, Yolo—Sallie Blodget.
G. W. Harlow, Brighton—Nellie.

Best one year old.

No entry.

DRAFT HORSES.

STALLIONS.

Best four years old or over.

Daniel Luce, Haywards—Victor.
E. Blanchard, San Mateo—Fritz.
Massey Thomas, Gilroy—Scottish Chief, Jr.
John Rodger, Contra Costa—Scott.

Best three years old.

M. L. Britton, Redwood City—Pool.

Best two years old.

M. L. Britton, Redwood City—Judge Templeton.

Best one year old.

No entry.

MARES.

Best four years old and over, with colt.

John Neal, Sacramento—Eliza and colt.

Best four years old.

J. A. Evans, Sacramento—Mary.

Best three years old.

F. M. Shepler, Sacramento—Mary.

Best two years old.

No entry.

Best one year old.

No entry.

ROADSTERS.

STALLIONS.

Best four years old and over.

C. W. Graves, Lincoln—Mystic.
George C. Wilson, Franklin, Sacramento—Bullion.
H. Schlutius, Franklin, Sacramento—Young Lightning.
Dr. B. J. Smith, San Francisco—Nabue.
Jacob Schleicher, San Francisco—Honest Bill.
E. Q. Crites, Yolo—John Nelson, Jr.

Joseph Thomas, Yolo—Billy Campbell.
L. H. Fasset, Sacramento—Nelson, Jr.
A. C. St. John, San José—Whipple.
J. D. Carr, Gabilan—Caras Membrina.
J. Sessions, Alameda—Gray Eddy.
D. W. Reavis, Chico—Blackbird.
A. M. Worthing, Sacramento—General Reno.
Stephen Eaton—California Dexter.

Best three years old.

Daniel Flint, Sacramento—Blondin.
J. Sessions, Alameda—King William.
S. B. Whipple, San Mateo—King George.
George Hack, Sacramento—Freeport.

Best two years old.

Daniel Flint, Sacramento—Jim Fisk.
Joshua Reeves, Lincoln—Black Phil.
William Hamilton, San José—Honest Allen.
D. M. Reavis, Chico—Blackbird, Jr.
G. M. McWain, Marysville—Young Bloomsbury.

GELDINGS.

Best four years old and over.

R. H. Newton, Woodland—Walker, three years.
W. G. Flower, Franklin—Prairie Boy, five years.
D. B. Sherman, Franklin—George Washington, six years.
H. R. Hughes, Fort Jones—Cock Robin, five years.
H. Schlutius, Franklin—Village Boy, five years.
Daniel Swett, San Francisco—Pride Putnam.
A. C. St. John, San José—Frank.
Orin Howman, Sacramento—Gray Buck.
P. J. Williams, Santa Clara—American Boy.
P. J. Williams, Santa Clara—Brilliant Allen.
J. M. C. Jaspar, Wheatland—Dan Rice.
W. A. Findley, Yuba—John.
Harris Covey, San Francisco—Oliver Marshall.
Tim. Sargent, San Francisco—Romeo.
A. D. Miller, Sacramento—Missouri Chief.
S. Harris, Oakland—Fred.

MARES.

Best four years old and over.

O. F. Ayers, Woodland—Puss.
Maurice Toomey, Brighton—Lady Brighton.
P. R. Beckley, Franklin—Maggie B.
G. S. Banks, San Francisco—Fanny Porter.

G. S. Banks, San Francisco—Nelly Herman.
Dr. D. Ray, Woodland—Lucy.
Wm. Hamilton, San José—Bess Allen.
Jacob S. Goin, San Francisco—Puss.
P. J. Williams, Santa Clara—Columbia Maid.
Thos. H. De Vall, Colusa—Kate Hayes.
Peter Burns, Sacramento—Lady Burns.
E. R. Jackson, Woodland—Nellie Low.
E. R. Jackson, Woodland—Minnie Baugh.
J. Sessions, Alameda—Young Diamond.
W. A. Findley, Yuba—Gypsy Girl.
W. K. Squires, Rio Vista—Maggie.
J. N. Killip, San Francisco—Pet.
J. C. Morrison, Jr., San Francisco—Lady Signal.

Best three years old.

H. Hubbard, Woodland—Whitefoot.
Joshua Reeves, Lincoln—Maggie Reeves.
Dr. B. J. Smith, San Francisco—Gypsy Nabue.
Wm. Hamilton, San José—Fannie Allen.
J. M. C. Jaspar, Wheatland—Lilly Calloway.
Harris Covey, San Francisco—Katty Britten.

Best two years old.

Maurice Toomey, Brighton—Lady Ralph.
Hiram E. Greer, Freeport—Dolly Varden.
H. Schlutius, Franklin—Libby Jeffries.
E. Greer, Freeport—Hattie.
E. Greer, Freeport—Picayune.
Wm. Hamilton, San José—Clara.
H. H. Fasset, Sacramento—Fleety.
L. H. Fasset, Sacramento—Alice Criswell.

CARRIAGE HORSES AND ROADSTER TEAMS.

Carriage horses.

J. M. Culp, Colusa—Flora and Eva.
J. Sessions, Alameda—Jim and Nell.
Jas. Roberts, Sacramento—Josie May and Mate.

Roadster teams.

A. J. Stiener, Woodland—Nestor and Priam.
Mrs. E. S. Mitchell, Sacramento—Tom and Jerry.
A. A. Royce, Solano—Chief and Nigger.
R. H. Byers, Sacramento—Flo. and Mate.
E. Wilson, San Francisco—Brown Billy and Mate.

Saddle horses.

Major M. Biggs, Biggs' Station—Wild Bill.
John P. Odbert, Sacramento—Billy.

C. Barney, Yolo—Ben Wade.
A. D. Miller, Sacramento—Lady of the Lake.

COLTS.

Best yearling horse colt.

George C. Wilson, Franklin—Leroy.
Anthony Green, Sacramento—Accident.
William Hamilton, San José—Tom Scott.
H. H. Fasset, Sacramento—Rusher.

Best yearling mare colt.

O. F. Ayers, Woodland—Minnehaha.
Joshua Reeves, Lincoln—Lillie Cox.
E. H. Miller, Jr., Sacramento—Flo.
E. H. Miller, Jr., Sacramento—Osis.
William Hamilton, San José—Fanchon.
G. Beckley, Brighton—Flora.

Best sucking colt.

Daniel Flint, Sacramento—Hambletonian Chief.
E. Pierce, Sacramento—S. M. Whipple.
C. H. Shear, Sacramento—Mark Hopkins.
Joshua Reeves, Lincoln—Joe Lincoln.
John Kennedy, Sacramento—Young America.
H. H. Fasset, Sacramento—Robin.

Best exhibit of not less than six colts, owned by one person.

William Hamilton, San José—Tom Scott, Clara, Tommy Allen, Bess Allen, Fanchon, Bay Filly, Honest Allen, and Kate.

Best sucking mare colt.

John H. Jackson, Cacheville—Queen of Diamonds.
John Neal, Sacramento—Lucy.
William Hamilton, San José—Kate.
G. Beckley, Brighton—Queen.
A. D. Miller, Sacramento—Lady Nelson.

SWEEPSTAKES.

Best stallion, of any age.

Theodore Winters, Davisville—Norfolk.
John Hall, Alvarado—Ironclad.
J. Sessions, Alameda—Ulster Chief.
D. M. Reavis, Chico—Blackbird, Jr.

Best mare, of any age.

John Hall, Alvarado—Peggy Ringgold.
John H. Jackson, Cacheville—Kate Sportsman.
William Hamilton, San José—Santa Clara.
J. Sessions, Alameda—California Maid.
H. Williamson, Sacramento—Mary Chilton.
William Boots, San José—Miami.
Theodore Winters, Davisville—Hennie Farrow.

Second best mare.

John H. Jackson, Cacheville—Flora Temple.

JACKS.

Best three years old.

Marion Biggs, Biggs' Station—Humboldt.

MULES.

Best span, of any age.

C. H. Wheeler, San José—Tom and Jake.

DURHAM CATTLE.

BULLS.

Best four years old and over.

Carr & Chapman, Gabilan—Old Sam.
Robt. Ashburner, Baden Station—Water Prince.
John Brewster, Galt—Harold the Eighth.
Coleman Younger, San José—Glencoe.
Chas. Clark, San José—Lincoln.
Wm. F. Gordon, Liberty, Mo.—Stonewall.
Cannon & Staples, Suisun—Perfection.

Best three years old.

Estate of Thos. S. Page, San Francisco (W. Page, ex.)—Childe Harold.
Carr & Chapman, Gabilan—Romeo.
Vernon & Flint, San José—Dandy Jim.
Wm. F. Gordon, Liberty, Mo.—Duke of Woodland and Rover.
Wm. Fleming, Napa—Second to None.
J. McIlmoil, Yuba—First Duke of Sutter.

Best two years old.

W. L. Overhiser, Stockton—Fourth Grand Turk of Oak Home.
J. B. Haggin, Sacramento—The Dean and Duke of the Wood.
G. N. Sweezy, Marysville—Second Duke of Yuba.
H. P. Saxe & Bro., San Francisco—Grand Prince.
Robt. Ashburner, Baden Station—Red Prince.
W. F. Gordon, Liberty, Mo.—General Grant.
E. Comstock, Yolo—Darien.
Cannon & Staples, Solano—Diamond.

Best one year old.

Estate of Thos. S. Page, San Francisco—Mazourka's Royal and Duke of Sutherland.
W. L. Overhiser, Stockton—Eleventh Grand Turk of Oak Home.
Wm. Queen, San José—Emmet Third.
Carr & Chapman—Warrior and Livingston.
John Brewster, Galt—Mohawk and Pacific.
Colonel C. Younger, San José—Highland Chief.
R. M. Sparks, Marysville—First Duke of Independence.
Colonel Younger, San José—Speculation.
Wm. F. Gordon, Liberty, Mo.—Seventh Duke of Liberty, Eighth Duke of Liberty, Twelfth Duke of Liberty, and Captain Jack.
E. Comstock, Yolo—First Duke of Yolo.
G. W. Scott, Yolo—Ninth Duke of Liberty.
J. McIlmoil, Yuba—Second Duke of Sutter.

Best bull calf.

Estate of Thomas S. Page, San Francisco—Sonoma.
Wm. L. Overhiser, Stockton—Seventeenth Grand Turk of Oak Home and Nineteenth Grand Turk of Oak Home.
Carr & Chapman, Gabilan—Frank.
G. N. Sweezy, Marysville—Duke of Sweezyanna, Ninth Duke of Yuba, Tenth Duke of Yuba, and Duke of Monserido.
Robt. Ashburner, Baden Station—Dr. Livingston and Starlight.
John Brewster, Galt—Onward.
R. M. Sparks, Marysville—Second Duke of Independence and Third Duke of Independence.
M. V. Sparks, Wheatland—Newton Booth.
G. N. Sweezy, Marysville—Prince of Yuba.

COWS.

Best four years old and over.

Estate of Thomas S. Page, San Francisco—Caroline Airdire.
W. L. Overhiser, Stockton—Rosette 2d and Rosette 3d.
J. B. Haggin, Sacramento—Fannie Gray.
William Queen, San José—Fuschia 2d.
Carr & Chapman, Gabilan—Lady Solway and Christobell.
G. N. Sweezy, Marysville—Beauty, Amelia, and Amelia 2d.
R. M. Sparks, Marysville—Miss Morgan and Eulalie.
M. V. Sparks, Wheatland—Maggie.

R. M. Sparks, Marysville—Jessie 2d and Elfleda 3d.
C. Younger, San José—Sprightly.
William F. Gordon, Liberty, Mo.—Second Belle of Liberty and Fanny.

Best three years old.

Estate of Thomas S. Page, San Francisco—Dauntless.
Carr & Chapman, Gabilan—Maid of Athens 3d, Laura, and Twin.
G. N. Sweezy, Marysville—Second Ione of Yuba.
Robert Ashburner, Baden Station—Sarah.
R. M. Sparks, Marysville—Elfleda 4th.
C. Younger, San José—Mary Stuart and Norma.

Best two years old.

Estate of Thomas S. Page, San Francisco—Gold Leaf, Ophie Pierce, and Nannie Richardson.
W. L. Overhiser, Stockton—Flora Temple 6th, Duchess de Argentine 4th, Tulip 10th, Curiosity 4th, Rosette 6th, and Miranda 11th.
J. B. Haggin, Sacramento—Stenie, Verity 4th, and Mary Shropshire.
Carr & Chapman, Gabilan—Miss Deadding and Hope 22d.
G. N. Sweezy, Marysville—Addie.
R. M. Sparks, Marysville—Starlight 2d.
C. Younger, San José—Jennie.
Charles Clark, San José—Mollie.

Best one year old.

Estate of Thomas S. Page, San Francisco—Belle Napier.
Carr & Chapman, Gabilan—Pet of Geneva, Rose, Dora, First Maid of Monterey, and Ellen.
G. N. Sweezy, Marysville—Duchess of Yuba, Amelia 4th, Daisy, Ione 3d of Yuba, and Amelia 5th.

Best heifer calf.

Carr & Chapman, Gabilan—Mollie and Welcome.
G. N. Sweezy, Marysville—Princess of Monserido, Princess of Yuba, Yubama, and Duchess of Sweezyanna.
Robert Ashburner, Baden Station—Garland and Cypress.
C. Younger, San José—Melrose.
E. Comstock, Yolo—Melvina and Nelsina.
Cannon & Staples, Solano—Peerless and Fashion.

DEVONS.

Best bull two years old.

Wm. Fleming, Napa—Earl of Leicester.

COWS.

Best four years old.

Wm. Fleming, Napa—Victoria.

Best heifer and calf.

Wm. Fleming, Napa—No Name.

JERSEY BULLS.

Best four years old and over.

Robt. Beck, Sacramento, agent for M. Crozier, of Beacon Farm, Long Island, N. Y.—Touchstone.
A. Maillard, San Rafael—Keystone.

COWS.

Best three years old.

A. Maillard, San Rafael—May 2d.

Best two years old.

A. Maillard, San Rafael—Marie.

Best one year old.

A. Maillard, San Rafael—Floradell.

Best calf.

A. Maillard, San Rafael—Bloomer 3d.

ALDERNEYS.

Best bull four years old and over.

A. Maillard, San Rafael—Emperor Billy.
L. J. Orcutt, Cammington, Mass.—Hero.

COWS.

Best four years old and over.

A. Maillard, San Rafael—Eliza.

Best three years old.

A. Maillard, San Rafael—Cora.

Best one year old.

A. Maillard, San Rafael—Bessie.

Best bull calf.

A. Maillard, San Rafael—Bismarck.

Best heifer calf.

A. Maillard, San Rafael—Corinne.

Best herd of ten thoroughbred cattle and not more than four males.

Carr & Chapman, Gabilan—Old Sam, Dora, Dana, Lexington, Lady Solway, Christobell, Laura, Maid of Athens 3d, Pet of Geneva, and Hope 22d.

G. N. Sweezy, Marysville—Second Duke of Yuba, Duke of Sweezyanna, Beauty, Addie, Ione 3d of Yuba, Duchess of Yuba, Daisy, Amelia, Fourth Princess of Yuba, and Princess of Monserido.

C. Younger, San José—Glencoe, Sprightly, Lady of the Lake, Mary Stewart, Norma, Jennie, Gem, Valley Maid, Melrose, and Vanguard.

Wm. F. Gordon, Liberty, Missouri—Stonewall, Duke of Woodland, General Grant, Susan, Fannie, Second Belle of Liberty, Ninth Belle of Liberty, Carnation Sixth, Carnation Seventh, Eighth Duke of Liberty.

AYRSHIRES.

Best bull three years old.

Robert Beck, Sacramento, for F. D. Curtiss, Kirby Homestead Farm, Charlton County, New York—Heber Kimball.

Mike Bryte, Sacramento—Dunbar.

Best one year old.

Robert Beck, Sacramento, for F. D. Curtiss—Lord Clyde.

Best bull calf.

Robert Beck, Sacramento, for F. D. Curtiss—Major Wentworth and Melancton Callagan.

Best cow four years old and over.

Robert Beck, Sacramento, for F. D. Curtiss—Kitty Clyde.
L. A. Upson, Sacramento—Flora McIvor.

Best one year old.

Mike Bryte, Sacramento—Thankful.
Mike Bryte, Sacramento—Winifred.

Best heifer calf.

L. A. Upson, Sacramento—Bonnie Jean.

GRADED CATTLE.

BULLS.

Best three years old.

Robert Ashburner, Baden Station—Duke.
Jeremiah Smith, San Mateo—King William.

Best one year old.

R. M. Sparks, Marysville—Joe Jaspar.
Charles Clark, San José—John Blacow.
L. A. Upson, Sacramento—Ashland.
E. Comstock, Yolo—Mike.

Best bull calf.

Robert Ashburner, Baden Station—Baden Boy.
Robert Ashburner, Baden Station—Butterfly.
Eli Willet, Knight's Landing—Young Jeff.
C. W. Clark, Sacramento—Young Grant.
Cannon & Staples, Solano—Ranger.
Cannon & Staples, Solano—Abe.

COWS.

Best four years old and over.

Robert Ashburner, Baden Station—Bloom.
Robert Ashburner, Baden Station—Tulip.
C. W. Clark, Sacramento—Emma.
E. Comstock, Yolo—White Lily.

Best three years old.

Robert Ashburner, Baden Station—Primrose.
C. W. Clark, Sacramento—Adeline.
E. Comstock, Yolo—Chub.

Best two years old.

William Queen, San José—Frederika.
Robert Ashburner, Baden Station—Flora.
Peter Burns, Sacramento—Maria.
E. Comstock, Yolo—Star.

Best one year old.

William Queen, San José—May Queen.
William Queen, San José—Harvest Queen.

C. Clark, San José—Lady Lonwood.
C. Clark, San José—Maggie Taylor.
E. Comstock, Yolo—Blanco.
E. Comstock, Yolo—Maggie.

SWEEPSTAKES.

Best bull of any age or breed.

Carr & Chapman, Gabilan—Old Sam.
G. N. Sweezy, Marysville—Second Duke of Yuba.
G. N. Sweezy, Marysville—Duke of Sweezyanna.
Estate of T. S. Page, San Francisco—Duke of Sutherland.
Estate of T. S. Page, San Francisco—Sonoma.
Vernon & Flint, San José—Dandy Jim.
Robert Ashburner, Baden Station—Water Prince.
Col. Coleman Younger, San José—Glencoe.
Wm. F. Gordon, Liberty, Missouri—General Grant.
Wm. F. Gordon, Liberty, Missouri—Stonewall.
R. M. Sparks, Marysville—Monkey John.

Second best bull.

Carr & Chapman, Gabilan—Romeo.

Best cow of any age or breed.

Estate of T. S. Page, San Francisco—Caroline Archie.
Estate of T. S. Page, San Francisco—Ophie Pierce.
G. N. Sweezy, Marysville—Beauty.
G. N. Sweezy, Marysville—Ione 3d of Yuba.
Col. C. Younger, San José—Sprightly.
Wm. F. Gordon, Liberty, Missouri—2d Belle of Liberty.
R. M. Sparks, Marysville—Miss Morgan.
Carr & Chapman, Gabilan—Pet of Geneva.
Carr & Chapman, Gabilan—Lady Solway.
Carr & Chapman, Gabilan—Christobell.

Best bull and five of his calves.

Carr & Chapman, Gabilan—Romeo and calves: Lexington, Ellen, Maid of Monterey, Yubanna, and Duchess of Sweezyanna.

Robert Ashburner, Baden Station—Water Prince and calves: Dr. Livingston, Garland, Cypress, Rosebud, and Apricot.

G. N. Sweezy, Marysville—Duke of Yuba and calves: Duke of Sweezyanna, Princess of Monserido, Princess of Yuba, Yubanna, and Duchess of Sweezyanna.

Colonel C. Younger, San José—Glencoe and calves: Mary Stuart, Jennie, Gem, Valley Maid, and Melrose.

William F. Gordon, Liberty, Missouri—Stonewall and calves: Seventh Duke of Liberty, Eighth Duke of Liberty, Eleventh Duke of Liberty, Twelfth Duke of Liberty, and Ninth Belle of Liberty.

Best yoke of oxen.

E. C. Singleterry, Colusa—Spot and Duke.

SHEEP.

CLASS I—SPANISH MERINO.

Best ram two years old and over.

Severance & Peet, Niles Station, Alameda County—Victor.
Amos Roberts, Benicia—California.
Smith & Chapman, Grayson—Comet, Jr.
C. C. Baker, Modesto—Matchless.
Estate of T. S. Page, San Francisco—Hero.
James E. Parker, Whiting, Vermont—Young Farnham.
C. C. Baker, Modesto—Golden Fleece.

Best ram over one year old and under two.

Severance & Peet, Niles Station—Big Leg.
Amos Roberts, Benicia—Benicia.
Smith & Chapman, Grayson—Grayson.
E. Percy, Hoosac, New York—No. 1.
E. Percy, Hoosac, New York—No. 2.
E. Percy, Hoosac, New York—No. 3.
James E. Parker, Whiting, Vermont—Young Romila.

Best three lambs.

Severance & Peet, Niles Station—Pen of three lambs.
C. C. Baker, Modesto—Pen of three lambs.
Estate of T. S. Page, San Francisco—Pen of three lambs.

Best five ewes, two years old and over.

Severance & Peet, Niles Station—Pen of five ewes.
C. C. Baker, Modesto—Pen of five ewes.
John A. Hill, Napa—Pen of five ewes.
E. Percy, Hoosac, N. Y.—Two pens of five ewes each.
James E. Parker, Whiting, Vt.—Pen of five ewes.
W. G. Brown, Sacramento—Pen of five ewes.

Best five ewes, over one year and under two years.

Severance & Peet, Niles Station—Pen of five ewes.
C. C. Baker, Modesto—Pen of five ewes.
E. Percy, Hoosac, New York—Two pens of five ewes each.
James E. Parker, Whiting, Vt.—Pen of five ewes.

Best five ewe lambs.

Severance & Peet, Niles Station—Pen of five ewe lambs.
C. C. Baker, Modesto—Pen of five ewe lambs.
Estate of Thomas S. Page, San Francisco—Pen of five ewe lambs.

FRENCH MERINOS.

Best ram, two years old and over.

Smith & Chapman, Grayson—San Joaquin.
Robert Blacow, Centerville—Napoleon 4th.
Robert Blacow, Centerville—Big Ben.
H. Wilcox, Dixon—No. 2.

Best ram, over one year and under two.

Smith & Chapman, Grayson—Merced.
R. A. Brompton, Dixon—Gift.
Robert Blacow, Centerville—Gamester.
H. Wilcox, Dixon—No. 1.

Best three ram lambs.

Smith & Chapman, Grayson—Pen of three lambs.
Robert Blacow, Centerville—Pen of three lambs.
H. Wilcox, Dixon—Pen of three lambs.

Best five ewes, two years and over.

Smith & Chapman, Grayson—Pen of five ewes.
Robert Blacow, Centerville—Pen of five ewes.
H. Wilcox, Dixon—Pen of five ewes.

Best five ewes, over one year and under two years.

Smith & Chapman, Grayson—Pen of five ewes.
Robert Blacow, Centerville—Pen of five ewes.

Best five ewe lambs.

Smith & Chapman, Grayson—Pen of five ewe lambs.
Robert Blacow, Centerville—Pen of five ewe lambs.
H. Wilcox, Dixon—Pen of five ewe lambs.

Best ram and five of his lambs.

Smith & Chapman, Grayson—Joaquin and five lambs.
Robert Blacow, Centerville—Napoleon 4th and five lambs.
H. Wilcox, Dixon—No. 2 and five lambs.

SILESIAN.

Best ram two years old and over.

Sullivan Treat, Elk Grove—Longfellow.
Robert Beck, Sacramento—No name.

Best ram one year old and under two.

Robert Beck, Sacramento—No name.

COTSWOLD SHEEP.

Best ram two years old and over.

William Fleming, Napa.

Best three ram lambs.

William Fleming, Napa.

GRADED SHEEP.

Best five ewes two years old and over.

William Fleming, Napa—Pen of five ewes.

Best five ram lambs.

George W. Hancock, Sacramento—Pen of six lambs.
R. A. Branton, Dixon—Pen of five lambs.
Estate of T. S. Page, San Francisco—Pen of five lambs.
H. Wilcox, Dixon—Pen of five lambs.
S. Treat, Elk Grove—Pen of five lambs.

Best five ewe lambs.

George W. Hancock, Sacramento—Pen of five ewe lambs.
Estate of T. S. Page, San Francisco—Pen of five ewe lambs.
S. Treat, Elk Grove—Pen of five ewe lambs.

SWEEPSTAKES.

Best ram and five of his lambs.

Severance & Peet, Niles Station—Victor, and five lambs.
Smith & Chapman, Grayson—Joaquin, and five lambs.
C. C. Baker, Modesto—Golden Fleece, and five lambs.
Estate of T. S. Page, San Francisco—Hero, and five lambs.
Robert Blacow, Centerville—Napoleon Fourth, and five lambs.

CASHMERE AND ANGORA GOATS.

Best thoroughbred buck two years old and over.

Landrum & Rogers, Watsonville—Buck.
T. Butterfield & Son, Hollister—Pet.
Moses Allen, Placer County—Pasha.
Thomas & Shirland, Auburn—Henry.
N. Gilmore, El Dorado—Vashti.

Best thoroughbred buck under two years.

Landrum & Rogers, Watsonville—Toby.
Butterfield & Son, Hollister—Young Andy.
Thomas & Shirland, Auburn—Charles.
N. Gilmore, El Dorado—Sultan.

CLASS II—GRADES.

Best buck two years old and over.

Butterfield & Son, Hollister—John.

Best buck under two years.

Butterfield & Son, Hollister—Dick.
N. Gilmore, El Dorado—Ben.

Best pen of three does two years and over.

Butterfield & Son, Hollister—Pen three does.

Best pen of three does under two years.

Butterfield & Son, Hollister—Pen three does.

SWEEPSTAKES—GOATS.

Best buck.

Landrum & Rogers, Watsonville—Tommy.
Butterfield & Son, Hollister—Pet.
Thomas & Shirland, Auburn—Henry.
N. Gilmore, El Dorado—Vashti.

Second best buck.

Butterfield & Son, Hollister—Jim.

Best doe.

Landrum & Rogers, Watsonville.
Butterfield & Son, Hollister—Mary.

Thomas & Shirland, Auburn—Fanny.
N. Gilmore, El Dorado—Black-eyed Mary.

Second best doe.

Butterfield & Son, Hollister—Ann.
N. Gilmore, El Dorado—Betsy.

Best pen of not less than ten kids.

Landrum & Rogers, Watsonville—Pen ten kids.
Butterfield & Son, Hollister—Pen ten kids.
N. Gilmore, El Dorado—Pen ten kids.

SWINE.

Best boar two years old and over.

Chas. Green, Rio Vista—Liberator.
R. M. Sparks, Marysville—Imported Torento, Jr.
Theo. Deming, Lakeport—General Warren.
R. S. Thompson, Napa City—Crown Prince, Jr.
James Moore, Freeport—Dick.

Best boar under two years old.

R. S. Thompson, Napa City—Young Comet.
Peter Burns, Sacramento—Essex pig, Dick.
J. Sessions, Alameda—Essex pig, Jack.
James Moore, Freeport—Whitefoot.

Best boar six months and under one year.

Joshua Fountain, Sacramento—Lake House Prince.
R. M. Sparks, Marysville—Bob. Lee.
Peter Burns, Sacramento—Essex pig, Jim.
R. S. Thompson, Napa City—No. 1.
E. Comstock, Yolo—Berkshire Jake.
Cannon & Staples, Solano—Ben.

Best breeding sow two years old and over.

A. S. Greenlaw, Sacramento—Bet.
Charles Green, Rio Vista—Ella, Essex breed.
R. S. Thompson, Napa City—America.
R. S. Thompson, Napa City—Beauty 2d.
James Moore, Freeport—Eliza.
James Moore, Freeport—Mary.

Best breeding sow one year old.

Charles Green, Rio Vista—Mary, Essex breed.
R. S. Thompson, Napa City—Dolly Varden.
R. S. Thompson, Napa City—Juno 2d.
E. Comstock, Yolo—Burk.
J. Sessions, Alameda—Bess, Essex.
James Moore, Freeport—Betsy.

Best sow six months old and under one year.

Joshua Fountain, Sacramento—Sally, Essex breed.
Joshua Fountain, Sacramento—Mary, Essex breed.
R. M. Sparks, Marysville—Betsy, Berkshire breed.
R. S. Thompson, Napa City—Gypsy Queen, Berkshire breed.
R. S. Thompson, Napa City—No. 1, Berkshire breed.
James Moore, Freeport—Florey.
M. Sprague, Sacramento—No name.
Cannon & Staples, Solano—Dolly.

Best pen of six pigs five months old and under ten months.

Charles Green, Rio Vista—Pen six Essex pigs.
R. M. Sparks, Marysville—Pen six Berkshire pigs.
R. S. Thompson, Napa City—Pen six Berkshire pigs.
James Moore, Freeport—Pen six Berkshire pigs.
Cannon & Staples, Solano—Pen six Berkshire pigs.

Best pen of ten pigs of any breed belonging to one owner.

A. S. Greenlaw, Sacramento—Pen ten pigs, Bet's pigs.
R. M. Sparks, Marysville—Pen ten pigs.
R. S. Thompson, Napa City—Pen ten pigs, Berkshire.
James Moore, Freeport—Pen ten pigs, Essex.
M. Sprague, Sacramento—Pen ten pigs.
Cannon & Staples, Solano—Pen ten pigs.

SWEEPSTAKES.

Best boar of any age or breed.

Theodore Deming, Lakeport—General Warren.
R. S. Thompson, Napa City—Crown Prince, Jr.
R. S. Thompson, Napa City—Young Comet.
R. M. Sparks, Marysville—Torento, Jr.

POULTRY.

Best lot of White Dorkings, Spanish, Black Polands, and Jersey Blues.

Peter Burns, Sacramento—White Dorkings, Black Polands, and Jersey Blues.
Robert Cowne, Sacramento—Jersey Blues.

Best lot of Sumatra Game, Light Bramahs, English Game, or any other distinct breed.

F. H. Miller, Sacramento—Light Bramahs.
Peter Burns, Sacramento—Light Bramahs.
W. J. Prather, Woodland—Light Bramahs.
Charles Green, Rio Vista—English Game.
F. H. Miller, Sacramento—English Game.
Peter Burns, Sacramento—Sumatra Game.
Hiram E. Greer, Freeport—Spanish chickens.
Andrew Greer, Freeport—Spanish chickens.
F. H. Miller, Sacramento—Dark Bramahs, Blue Pile Games, Heatherwood Games, Golden Polands, Japanese Bantams, Silver Spangled Hamburgs, Buff Cochins, Irish Ratler Games.

Any other varieties.

F. H. Miller, Sacramento—Partridge Cochins.
Bartley Cavanagh, Sacramento—Irish Games.
Peter Burns, Sacramento—Royal Cochin China.
Robert Cowne, Sacramento—Golden Pencils, Dominicas.
M. J. Little, Jackson—Buff Cochin, White Leghorn.
W. J. Prather, Woodland—Buff Cochins, Houdans, Dark Bramahs, Golden Seabright Bantams.

Best lot of turkeys.

Hiram E. Greer, Freeport—Lot of turkeys.
Robert Cowne, Sacramento—Lot of turkeys.
P. H. Fisher, Brighton—Lot of turkeys.

Best lot of ducks.

Peter Burns, Sacramento—Lot of Topknot ducks.
W. J. Prather, Woodland—Lot of Roman ducks.
P. H. Fisher, Brighton—Lot of gray ducks.

Best lot of geese.

Peter Burns, Sacramento—Lot of Whitefront American geese.
Robert Cowne, Sacramento—Lot of Bremen geese.
P. H. Fisher, Brighton—Gray geese.

ARTICLES EXHIBITED AT THE PAVILION.

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SECOND DEPARTMENT.

CLASS I—MACHINERY, IMPLEMENTS, ETC.

Date.	No. Entry.	Article.	Name and Post Office address of exhibitor.
Sept. 13, 1873.	1	One automatic car coupling	Leaman & Co., Dayton, Ohio.
“	2	Working model hoisting engine	H. Williams, Sacramento.
“	3	One Babcock fire engine, No 2.	R. B. Irwin & Co., San Francisco.
“	4	One Babcock hook and ladder truck, No. 3.	R. B. Irwin & Co., San Francisco.
“	5	Nine Babcock portable fire extinguishers	R. B. Irwin & Co., San Francisco.
“	6	One Babcock Niele plate extinguisher	R. B. Inwin & Co., San Francisco.
“	7	One Babcock Farnish copper extinguisher	R. B. Irwin & Co., San Francisco.
“	8	One Babcock Baby extinguisher	R. B. Irwin & Co., San Francisco.
Sept. 15, 1873.	9	One Whitman's portable pump, sprinkler, and fire extinguisher	M. S. Bowdish, San Francisco.
“	10	One Babcock hook and ladder truck, No. 1	R. B. Irwin & Co., San Francisco.
“	11	One saw gummer	Huntington, Hopkins & Co., Sacramento.
“	12	One car coupling model	Jas. Pearson, Sacramento.
Sept. 16, 1873.	13	Two Lithgow fire extinguishers.	G. R. Grant, Roseville.
“	14	One Ames mounted engine	Baker & Hamilton, Sacramento.
“	15	One Baxter portable engine	Baker & Hamilton, Sacramento.
“	16	Three rock-boring machines	A. J. Doolittle, Liberty Hill, Nevada County.
“	17	One case, six Babcock fire extinguishers	R. B. Irwin & Co., San Francisco.
“	18	Twelve combination twin nozzles	R. B. Irwin & Co., San Francisco.

CLASS II.

Date.	No. Entry.	ARTICLE.	Name and Post Office address exhibitor.
Sept. 12, 1873.	1	Ithica horse hay rake	Treadwell & Co., San Francisco
Sept. 15, 1873.	2	Two post augers (one at Park)	Thos. Orchard, Sacramento.
"	3	Two well augers	Thos. Orchard, Sacramento.
"	4	Two hay cutters	M. C. Hawley & Co., San Fra-cisco.
"	5	One lot gopher traps	Huntington, Hopkins & Co., Sa-ramento.
"	6	One lot well augers	Huntington, Hopkins & Co., Sa-ramento.
"	7	One revolving hay rake	Keller & Co., Sacramento.
"	8	One vibrating thrasher	Keller & Co., Sacramento.
"	9	One sweep, horsepower (California manufacture)	Laufkotter Bros. & Churchman, Sacramento.
"	10	One patent post-hole auger	W. B. Ready, Sacramento.
"	11	One lawn sprinkler	M. A. Cahn, San Francisco.
"	12	One lock lever hay rake	Baker & Hamilton, Sacramento
"	13	One Pitt's California thrasher	Baker & Hamilton, Sacramento
"	14	One Pitt's mounted horsepower.	Baker & Hamilton, Sacramento
"	15	One Price's hay press (California manufacture)	C. H. Hubbard, Sacramento.
"	16	One Young America hay press (California manufacture)	W. H. McBurney, Sacramento
Sept. 18, 1873.	17	One Furst & Bradley sulky rake	Linforth, Kellogg & Co., Sa Francisco.

CLASS III.

Date.	No. Entry.	ARTICLE.	Name and Post Office address exhibitor.
Sept. 12, 1873.	1	One Ætna mower	Treadwell & Co., San Francisco
"	2	One Ætna self-rake reaping and mowing machine combined	Treadwell & Co., San Francisco
"	3	One two-horse Hoosier drill	Treadwell & Co., San Francisco
"	4	One ten-foot single gear header	Treadwell & Co., San Francisco
Sept. 13, 1873.	5	One rotary sod cutter	Josiah Pool, Rio Vista, Sola County.
Sept. 15, 1873.	6	One broadcast seeder	M. C. Hawley & Co., San Fra-cisco.
"	7	One harrow	M. C. Hawley & Co., San Fra-cisco.
"	8	One Wood's mower	R. L. Holman, San Francisco.
"	9	One Wood's mower and self-rake reaper combined	R. L. Holman, San Francisco.
"	10	One Jr. Buckeye mower	Keller & Co., Sacramento.
"	11	One medium Buckeye mower	Keller & Co., Sacramento.
"	12	One medium Excelsior mower	Keller & Co., Sacramento.
"	13	One Gorham broadcast seeder and cultivator	Keller & Co., Sacramento.
"	14	Two barley forks	Keller & Co., Sacramento.
"	15	One horse hoe	E. W. Walton, Vallejo, Sola County.
"	16	One rotary harrow	W. B. Ready, Sacramento.
"	17	One self-sharpening cultivator	W. B. Ready, Sacramento.

CLASS III—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	18	Two Wood's Eagle mowers	Alfred Slocum, Vallejo, Solano County.
Sept. 16, 1873.	19	One hay pitching machine } Park.	Mattison & Williamson, Stockton.
"	20	One self-sharpening chisel cultivator } Park.	Mattison & Williamson, Stockton.
"	21	One Taylor harrow	B. W. Taylor, Roseville, Placer County.
"	22	One Excelsior self-rake reaper and mower combined	Keller & Co., Sacramento.
"	23	One Buckeye mower	Baker & Hamilton, Sacramento.
"	24	One Champion mower	Baker & Hamilton, Sacramento.
"	25	Two Gem broadcast sowers	Baker & Hamilton, Sacramento.
"	26	One rotary harrow	Baker & Hamilton, Sacramento.
"	27	One square harrow	Baker & Hamilton, Sacramento.
"	28	One flexible harrow	Baker & Hamilton, Sacramento.
Sept. 18, 1873.	29	One Friedman's patent harrow	Linforth, Kellogg & Co., San Francisco.
"	30	One World mower and reaper combined	Linforth, Kellogg & Co., San Francisco.

CLASS IV.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 12, 1873.	1	One Pacific grain separator and fanning mill	Treadwell & Co., San Francisco.
Sept. 13, 1873.	2	Three Nash & Cutt's grain separator and fanning mill combined	Nash, Miller & Co., Sacramento.
Sept. 15, 1873.	3	One Challenge feed mill	M. S. Bowdish, San Francisco.
"	4	One Challenge feed mill	M. S. Bowdish, San Francisco.
"	5	Two platform scales	Huntington, Hopkins & Co., Sacramento.
Sept. 16, 1873.	6	One Burstone feed mill	Baker & Hamilton, Sacramento.
"	7	One Nonpariel feed mill	Baker & Hamilton, Sacramento.
"	8	Two Fisher's patent refrigerators	R. C. Terry & Co., Sacramento.

CLASS VII—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 16, 1873.	23	Display carriage material and trimmings	Waterhouse & Lester, San Francisco and Sacramento.
"	24	Two Bain's farm wagons	Baker & Hamilton, Sacramento.
"	25	One farm wagon for general purposes	Copeland & Davis, Sacramento.
"	26	One set Forsion springs	Copeland & Davis, Sacramento.
"	27	One two-horse family carriage	Pollard & Carvill, San Francisco.
"	28	One one-horse family carriage	Pollard & Carvill, San Francisco.
"	29	One extension top rockaway	Pollard & Carvill, San Francisco.
"	30	One gold mounted top buggy	Pollard & Carvill, San Francisco.
"	31	One silver mounted buggy	Pollard & Carvill, San Francisco.
"	32	One trotting wagon	Pollard & Carvill, San Francisco.
"	33	Four carriages or cabs for children (upper hall)	Dale & Co., Sacramento.
"	34	Four top buggies	Kimball, May & Co., San Francisco.
"	35	Six open buggies	Kimball, May & Co., San Francisco.
"	36	One patent open buggy, wood "C" and steel spring combined	D. Mason, Sacramento.
"	37	One open buggy, side spring	D. Mason, Sacramento.
Sept. 17, 1873.	38	One rockaway	Kimball, May & Co., San Francisco.
"	39	Exhibition of preserved wood	Pacific Wood Preserving Company, San Francisco.
"		One Sargent's portable carriage top	G. L. Mason, Burlington, Vermont.

DUPLICATE OF ENTRIES—LOWER HALL.

CLASS II.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873	1	One lot rubber hose and belting	Huntington, Hopkins & Co., Sacramento.
"	2	One lot leather hose and belting	Huntington, Hopkins & Co., Sacramento.
"	3	Two sets Concord farm harness	Parker & Perry, Sacramento.
"	4	One set carriage harness	Parker & Perry, Sacramento.
"	5	One set buggy single strap harness	Parker & Perry, Sacramento.
"	6	Display saddles, bridles, blankets, etc	Parker & Perry, Sacramento.

THIRD DEPARTMENT.

CLASS I.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 12, 1873.	1	One knit bedspread (lady eighty years old)	Mrs. H. N. Woods, Sacramento.
Sept. 13, 1873.	38	One button rug	Mrs. M. E. Miller, Sacramento.
"	43	One knit bedspread, knit in one piece	Mrs. R. Haas, Sacramento.
"	44	One pair pillow cases	Mrs. R. Haas, Sacramento.
"	72	Rag carpet	Mrs. E. Frick, Rocklin.
Sept. 15, 1873.	80	Two rag rugs (lady seventy-six years of age)	N. P. Smith, Benicia.
"	84	Seventy-two pieces ribbon	Joseph Green, Oakland.
"	144	One pair knit pillow cases	Mrs. R. Haas, Sacramento.
"	155	Three pair knit stockings, one pair open work, one pair rib, and one pair plain	Mrs. J. H. Haskell, Sacramento.
"	171	One knit bedspread	Mrs. J. P. Odbert, Sacramento.
"	174	Display of cordage	Huntington, Hopkins & Co., (for Tubbs & Co, San Francisco.)
"	176	One knit bedspread	Mrs. G. L. Powell, Sacramento.
"	283	One rag rug	Mrs. Lizzie C. Vance, Sacramento.
"	274	Three pieces rag carpet	Alex. McKay, San Francisco.
"	284	One pair woolen blankets	San José Woolen Mills, San José.
"	287	One linen wove counterpane, one hundred years old	Mrs. R. H. Byers, Sacramento.
"	288	One pair linen wove sheets, one hundred years old	Mrs. R. H. Byers, Sacramento.
"	301	Best display woolen goods from one manufacture	Capital Woolen Mills, Sacramento.
"	302	Four pieces woolen cloth	Capital Woolen Mills, Sacramento.
"	303	Twenty-six pieces cassimere	Capital Woolen Mills, Sacramento.
"	304	One piece jean	Capital Woolen Mills, Sacramento.
"	305	Three pieces tweed	Capital Woolen Mills, Sacramento.
"	306	Two pieces flannel	Capital Woolen Mills, Sacramento.
"	307	Four pairs Mackinack blankets	Capital Woolen Mills, Sacramento.
"	308	Three pairs woolen blankets	Capital Woolen Mills, Sacramento.
"	309	Four flannel shirts	Capital Woolen Mills, Sacramento.
"	351	One piece woolen carpet, home made	Mrs. Mary A. Sheldon, San Francisco.
"	389	Two pairs knit drawers	Mrs. H. Kuhl, Sacramento.
"	390	Two knit shirts	Mrs. H. Kuhl, Sacramento.
"	391	Assortment of German knit goods	Mrs. H. Kuhl, Sacramento.
"	459	Best display naval and military goods, and regalia	Dale & Co., Sacramento.
"	460	Best display of fancy goods	Dale & Co., Sacramento.

CLASS I—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	461	Best display of stocking yarn	Dale & Co., Sacramento.
"	523	Thirty-one bows, and nine neckties	S. Wilzinski, Sacramento.
"	563	Best exhibit of shoulder braces and corsets	Michael Kraker, Sacramento.
"	564	Best display of dry goods	Michael Kraker, Sacramento.
"	565	Best display of fancy goods	Michael Kraker, Sacramento.

CLASS II—LEATHER, RUBBER, AND PAPER.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 12, 1873.	7	Eight trunks	S. J. Nathan, Sacramento.
"	8	Fifteen valises	S. J. Nathan, Sacramento.
Sept. 13, 1873.	53	Rock River and Badger State building paper	Brown Bros., Sacramento.
Sept. 15, 1873.	123	One pair ladies' slippers	A. Markewitz, Sacramento.
"	124	One pair ladies' gaiters	A. Markewitz, Sacramento.
"	125	One pair ladies' bootees	A. Markewitz, Sacramento.
"	126	Display of ladies and girls' boots, shoes, and gaiters	A. Markewitz, Sacramento.
"	158	Four Mexican saddletrees	M. Schink, Sacramento.
"	181	Display of book binding	F. Foster, Sacramento.
"	462	Best display of paper	Dale & Co., Sacramento.
"	524	Two men's suits	S. Wilzinski, Sacramento.
"	525	Three youths' suits	S. Wilzinski, Sacramento.
"	526	Nineteen boys' suits	S. Wilzinski, Sacramento.
"	527	Ten boys' overcoats	S. Wilzinski, Sacramento.
"	528	Twelve suits fancy costumes	S. Wilzinski, Sacramento.
"	533	Display of decorative paper hangings and borders	C. H. Krebs, Sacramento.
"	580	Best pair ladies' slippers	Jas. Parsons, Sacramento.
"	581	Best pair ladies' gaiters	Jas. Parsons, Sacramento.
"	582	Best pair ladies' bootees	Jas. Parsons, Sacramento.
"	583	Best display of ladies and girls' boots and shoes	Jas. Parsons, Sacramento.

CLASS III.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 12, 1873.	2	One embroidered ottoman cover.	Mrs. H. M. Richards, Sacramento.
"	5	One slipper case	Mrs. A. Weston, Sacramento.
"	6	One pincushion	Mrs. A. Weston, Sacramento.
"	3	One log cabin quilt	Mrs. A. Weston, Sacramento.
"	4	One patchwork quilt	Mrs. A. Weston, Sacramento.
Sept. 13, 1873.	10	One hair wreath	Mrs. L. L. Landerkin, Sacramento.
"	11	One wreath skeleton leaves	Mrs. L. L. Landerkin, Sacramento.
"	24	One tatting tidy	Miss Emma Tubbs, Sacramento.
"	25	Four tidies, Berlin work	Miss Emma Tubbs, Sacramento.
"	26	One pair worsted mats	Miss Emma Tubbs, Sacramento.
"	27	One white cross, in wax	Miss Minnie Winning, Sacramento.
"	34	One paper wreath, made of old letters	Mrs. Wm. Gwynn, Sacramento.
"	35	One satin embroidered apron	Mrs. N. J. Brown, Sacramento.
"	37	One worsted wreath	Mrs. M. E. Miller, Sacramento.
"	40	One case phantom leaves	Mrs. M. A. Moorhead, Sacramento.
"	41	One sea moss wreath	Mrs. M. A. Moorhead, Sacramento.
"	45	One hair wreath	Mrs. J. G. Storch, Sacramento.
"	46	One hair wreath	Miss Annie Gerber, Sacramento.
"	47	One wax wreath	Miss Annie Gerber, Sacramento.
"	48	One wax white cross	Miss Annie Gerber, Sacramento.
"	36	Two patchwork quilts, star	Mrs. N. J. Brown, Sacramento.
"	54	Three pairs lamp mats (not entered for premium)	Mrs. C. H. Stevens, Sacramento.
"	55	Three tidies (not entered for premium)	Mrs. C. H. Stevens, Sacramento.
"	56	One set ladies' underwear (not entered for premium)	Mrs. C. H. Stevens, Sacramento.
"	57	Three white crosses, in wax	Mrs. J. E. Cotter, Sacramento.
"	58	Three lots of wax flowers—calla lily, blue violets, and variegated leaves	Mrs. J. E. Cotter, Sacramento.
"	59	Three bouquets, flowers, in wax	Mrs. J. E. Cotter, Sacramento.
"	60	One basket flowers, in wax	Mrs. J. E. Cotter, Sacramento.
"	61	One case pond lilies	Mrs. J. E. Cotter, Sacramento.
"	62	One cluster of Autumn leaves	Mrs. J. E. Cotter, Sacramento.
"	63	One sprig of arbutulon, in wax	Mrs. J. E. Cotter, Sacramento.
"	64	One basket and two plates wax fruit	Mrs. J. E. Cotter, Sacramento.
"	65	One frame wax flowers	Mrs. J. E. Cotter, Sacramento.
"	66	One box wax flower materials	Mrs. J. E. Cotter, Sacramento.
"	67	One cut perforated paper cross, in frame	Mrs. J. E. Cotter, Sacramento.
"	68	One case phantom leaves	Mrs. J. E. Cotter, Sacramento.
"	69	One pair knitted silk hose	Mrs. J. E. Cotter, Sacramento.
"	70	One crochet Honeton collar	Mrs. J. E. Cotter, Sacramento.
Sept. 15, 1873.	86	One basket natural flowers, preserved without enamel	Mme. Anna Getz Lucas, San Francisco.
"	87	Five cases natural flowers, preserved and enameled	Mme. Anna Getz Lucas, San Francisco.
"	88	One basket wax fruit, containing thirty-five varieties	Mme. Anna Getz Lucas, San Francisco.

CLASS III—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	89	One plate nectarines (special entry), in wax	Mme. Anna Getz Lucas, San Francisco.
"	90	Two baskets cherries (special entry), in wax	Mme. Anna Getz Lucas, San Francisco.
"	91	One plate figs (special entry), in in wax.	Mme. Anna Getz Lucas, San Francisco.
"	92	One plate Seckel pears (special entry), in wax	Mme. Anna Getz Lucas, San Francisco.
"	93	One plate bellflower apples (special entry), in wax	Mme. Anna Getz Lucas, San Francisco.
"	94	One plate blackberries (special entry), in wax	Mme. Anna Getz Lucas, San Francisco.
"	95	One plate currants (special entry), in wax	Mme. Anna Getz Lucas, San Francisco.
"	96	One plate of oranges and lemons (special entry), in wax	Mme. Anna Getz Lucas, San Francisco.
"	97	Two vases wax flowers (special entry)	Mme. Anna Getz Lucas, San Francisco.
"	98	Two cases water lilies, to be made at Pavilion	Mme. Anna Getz Lucas, San Francisco.
"	99	One wax cross, rustic (statuary)	Mme. Anna Getz Lucas, San Francisco.
"	100	One American eagle (statuary), in wax	Mme. Anna Getz Lucas, San Francisco.
"	104	One case pond lilies	Miss Katie Stephens, Woodland.
"	105	One case Autumn leaves.	Miss Katie Stephens, Woodland.
"	106	One crochet bedspread	Mrs. J. R. Wilkinson, Sacramento.
"	112	Six paper frames	Mrs. W. M. Corbusier, Sacramento.
"	113	Five paper baskets	Mrs. W. M. Corbusier, Sacramento.
"	114	Three pair gloves, one pair mittens, and one pair ladies' gauntlets (Whitten's patent)	G. L. Mason, Burlington, Vermont.
"	115	Two hair wreaths, one human, and one horse hair	Mrs. S. Sims, Sacramento.
"	116	One worsted wreath	Mrs. S. Sims, Sacramento.
"	117	One paper what-not	Mrs. R. Dunnavent, Sacramento.
"	118	One silk wreath	Katie Studarus (thirteen years old), Brighton.
"	119	One wax flower wreath	Katie Studarus (thirteen years old), Brighton.
"	120	One wax cross	Katie Studarus (thirteen years old), Brighton.
"	121	One hair wreath	Miss Josephine Buser (age thirteen years), Sacramento.
"	122	Two crochet caps	Miss Josephine Buser (age thirteen years), Sacramento.
"	127	One pair braided pillow cases	Mrs. H. M. Richards, Sacramento.

CLASS III—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	129	Two pincushions, bead embroidered	Mrs. S. Tryon, Sacramento.
"	130	One pair slippers, bead embroidered	Mrs. S. Tryon, Sacramento.
"	131	One crochet infant's carriage blanket	Mrs. W. H. Milliken, Sacramento.
"	132	One crochet ladies' cape	Mrs. W. H. Milliken, Sacramento.
"	133	Two crochet infant sacques	Mrs. W. H. Milliken, Sacramento.
"	134	Two pair crochet socks	Mrs. W. H. Milliken, Sacramento.
"	135	One crochet cap	Mrs. W. H. Milliken, Sacramento.
"	136	Two crochet hoods	Mrs. W. H. Milliken, Sacramento.
"	137	One crochet toilet set, three pieces	Mrs. W. H. Milliken, Sacramento.
"	138	One Java canvas toilet set, three pieces	Mrs. W. H. Milliken, Sacramento.
"	139	One Java canvas tidy	Mrs. W. H. Milliken, Sacramento.
"	140	One crochet tidy	Mrs. W. H. Milliken, Sacramento.
"	141	One netting and darned collar	Mrs. W. H. Milliken, Sacramento.
"	146	One feather wreath	Miss C. Deterding, Brighton.
"	147	One hair wreath	Miss Julia Deterding, Brighton.
"	149	One set linen embroidery (bed set)	Mrs. H. S. Crocker, Sacramento.
"	150	Best silk bonnet	Mrs. R. W. Murphy, Sacramento.
"	151	Best velvet bonnet	Mrs. R. W. Murphy, Sacramento.
"	152	Best artificial flowers	Mrs. R. W. Murphy, Sacramento.
"	153	Best display of millinery	Mrs. R. W. Murphy, Sacramento.
"	154	One braided mat	Mrs. J. H. Haskell, Sacramento.
"	177	One worsted rug	Miss Alice Powell, Sacramento.
"	178	One worsted quilt	Miss Alice Powell, Sacramento.
"	184	One ladies' walking suit	A. Hamburger & Co., Sacramento.
"	189	One wreath human hair	Mrs. Clark Stringham, Sacramento.
"	190	One sofa pillow	Mrs. J. H. Carroll, Sacramento.
"	191	Two footstools	Mrs. J. H. Carroll, Sacramento.
"	192	One toilet set (cushion and two mats)	Mrs. J. H. Carroll, Sacramento.
"	194	One worsted carriage robe	Mrs. G. W. Jenkins, Sacramento.
"	203	One worsted picture in frame	Mrs. Emelia Luhrs, Sacramento.
"	206	One toilet box (lace and embroidered)	Mrs. Mebius, Sacramento.
"	207	Eight toilet mats	Mrs. Mebius, Sacramento.
"	208	One embroidered towel rack	Mrs. Mebius, Sacramento.
"	209	One embroidered hearth rug	Mrs. Mebius, Sacramento.
"	210	One pair embroidered pillow cases	Mrs. Mebius, Sacramento.

CLASS III—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	211	One embroidered sofa pillow	Mrs. Julius Wetzlar, Sacramento.
“	212	One pair embroidered pillow cases	Mrs. Julius Wetzlar, Sacramento.
“	213	One embroidered bracket, with beads..............................	Mrs. Julius Wetzlar, Sacramento.
“	214	One embroidered tidy...............	Mrs. Julius Wetzlar, Sacramento.
“	215	One embroidered toilet box.......	Mrs. Julius Wetzlar, Sacramento.
“	216	Five toilet mats........................	Mrs. Julius Wetzlar, Sacramento.
“	217	One child's afghan..................	Mrs. Mollie Hahn, Sacramento.
“	218	One child's embroidered skirt....	Mrs. Mollie Hahn, Sacramento.
“	219	One child's embroidered shawl..	Mrs. Mollie Hahn, Sacramento.
“	220	One child's embroidered dress...	Mrs. Mollie Hahn, Sacramento.
“	221	One handkerchief case	Mrs. Robert Beck, Sacramento.
“	222	One embroidered jacket............	Mrs. Robert Beck, Sacramento.
“	223	Fifteen pieces ladies' under garments, hand and machine sewing	Mrs. Robert Beck, Sacramento.
“	227	One worsted quilt......................	Mrs. M. E. Coolidge, San Francisco.
“	264	One fancy baby suit...................	Miss Mary Huelsmann, Sacramento.
“	275	One worsted picture....................	Bertha Groth, Sacramento.
“	276	One crochet tidy.........................	Bertha Groth, Sacramento.
“	280	One pincushion	Mrs. L. Griggs, Sacramento.
“	281	Two tidies	Mrs. L. Griggs, Sacramento.
“	282	One sofa pillow...........................	Mrs. L. Griggs, Sacramento.
“	101	One patch-work quilt for doll baby, made by girl four years old	Mabel Alden, Placerville.
“	157	Two fancy quilts, one pine apple, and one May rose pattern	Mrs. Peter Davis, Sacramento.
“	169	One silk quilt.......................	Mrs. J. P. Odbert, Sacramento.
“	170	One patch-work quilt..................	Mrs. J. P. Odbert, Sacramento.
“	179	One patch-work quilt..................	Miss Jennie Bradley, Sacramento.
“	226	Two silk quilts (one child's, one banner)	Mrs. M. E. Coolidge, San Francisco.
“	179	Two quilt blocks...........................	Mrs. L. Griggs, Sacramento.
“	289	Two worsted mats........................	Mrs. R. H. Byers, Sacramento.
“	295	One crochet bedspread..............	Mrs. F. W. Reinhart, Sacramento.
“	296	Two crochet pillow cases..........	Mrs. F. W. Reinhart, Sacramento.
“	297	Two silk embroidered ottoman covers....................................	Mrs. G. G. Morgan, Sacramento.
“	300	One wax bouquet	Miss Annie Gerber, Sacramento.
“	310	One bouquet worsted flowers......	Miss Myrtle Dickinson (aged ten years), Sacramento.
“	311	Two cases, in wax	Mme. Anna Getz Lucas, San Francisco.
“	335	One Greek slave..........................	Mrs. J. E. Cotter, Sacramento.
“	356	One silk bonnet...........................	Mrs. Springer, Sacramento.
“	357	One velvet bonnet.......................	Mrs. Springer, Sacramento.
“	358	Display of artificial flowers and feathers	Mrs. Springer, Sacramento.
“	359	Display of millinery goods........	Mrs. Springer, Sacramento.
“	360	Five silk and velvet bonnets......	Mrs. Springer, Sacramento.
“	362	One down pillow and comfort ...	Mrs. Jas. Lansing, Sacramento.
“	364	One silk embroidered shawl......	Miss Ella Lansing (aged nine years), Sacramento.
“	365	One cotton embroidered skirt.....	Miss Ella Lansing (aged nine years), Sacramento.
“	366	One silk embroidered picture.....	Mrs. Jas. Lansing, Sacramento.

CLASS III—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	380	Assortment of infants' and children's knit and crochet caps, etc	Mrs. H. Kuhl, Sacramento.
“	381	Two child's afghans.....................	Mrs. H. Kuhl, Sacramento.
“	382	One ottoman cover.......................	Mrs. H. Kuhl, Sacramento.
“	383	One lampstand mat.....................	Mrs. H. Kuhl, Sacramento.
“	384	One crochet shawl	Mrs. H. Kuhl, Sacramento.
“	385	Silk embroidery...........................	Mrs. H. Kuhl, Sacramento.
“	386	Knit cloak.....................................	Mrs. H. Kuhl, Sacramento.
“	387	One fancy pincushion..................	Mrs. H. Kuhl, Sacramento.
“	388	One infant's wardrobe.................	Mrs. H. Kuhl, Sacramento.
“	392	Collection of furs	D. H. Quinn, Sacramento.
“	393	One hair wreath...........................	Miss J. M. Pierce, Sacramento.
“	394	One feather wreath......................	Miss J. M. Pierce, Sacramento.
“	395	One crochet table cover	Miss J. M. Pierce, Sacramento.
“	396	One crochet tidy.........................	Miss J. M. Pierce, Sacramento.
“	397	Three tatting collars..................	Miss J. M. Pierce, Sacramento.
“	398	One pair tatting undersleeves....	Miss J. M. Pierce, Sacramento.
“	399	One pincushion, bead embroidered..	Miss J. M. Pierce, Sacramento.
“	400	One watch case, bead embroidered..	Miss J. M. Pierce, Sacramento.
“	401	Tatting case, jewel box, glove box, and card basket...............	Miss J. M. Pierce, Sacramento.
“	402	One worsted picture, “Ship of State.”	Mrs. Mary Roley, Sacramento.
“	412	One knitted tidy..........................	Mrs. H. Griffeth, Sacramento.
“	414	One child's apron, made by hand	Miss Emma Hartwell (ten years old), Sacramento.
“	416	Best silk hat.................................	D. H. Quinn, Sacramento.
“	417	Best soft hat................................	D. H. Quinn, Sacramento.
“	418	Best display of men's and boys' hats and caps..............................	D. H. Quinn, Sacramento.
“	463	Five worsted ottoman covers.....	Dale & Co., Sacramento.
“	464	Four worsted table covers.........	Dale & Co.. Sacramento.
“	465	Three worsted fancy chair cushions and backs..........................	Dale & Co., Sacramento.
“	466	Six worsted lampstand mats......	Dale & Co., Sacramento.
“	467	Two worsted embroidered sofa cushions.......................................	Dale & Co., Sacramento.
“	468	Two silk embroidered piano stool covers.....	Dale & Co., Sacramento.
“	469	Three silk embroidered and zephyr worsted chair covers...	Dale & Co., Sacramento.
“	470	Two bead embroidered sofa patterns	Dale & Co., Sacramento.
“	471	Three bead and chenile and zephyr sofa patterns.................	Dale & Co., Sacramento.
“	472	Eight worsted embroidered pictures	Dale & Co., Sacramento.
“	473	One frame skeleton leaves.........	Dale & Co., Sacramento.
“	474	One frame shell work.................	Dale & Co., Sacramento.
“	475	One frame and picture of seeds, nuts, and shells........................	Dale & Co., Sacramento.
“	478	Best silk hat.................................	J. C. Meussdorffer, Sacramento.
“	479	Best soft hat................................	J. C. Meussdorffer, Sacramento.
“	480	Best display of men's and boys' hats and caps	J. C. Meussdorffer, Sacramento.
“	483	One child's afghan......................	Mrs. E. C. Atkinson, Sacramento.

CLASS III—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	489	Three watch cases, bead embroidered	Mrs. E. A. Welty, Sacramento.
"	490	One pincushion, bead embroidered	Mrs. E. A. Welty, Sacramento.
"	508	One worsted sofa pillow	Mrs. A. G. Read, Woodland.
"	509	One worsted footstool cover	Mrs. A. G. Read, Woodland.
"	529	Nine white embroidered gents' shirts	S. Wilzinski, Sacramento.
"	532	One canvas tidy	Miss Ella Smith, Sacramento.
"	536	Three pieces tatting, viz: one piece silk lace, one tidy and barbe	Mrs. L. Bruckerman, Brooklyn, Alameda county.
"	537	One linen and lace skirt	Mrs. A. M. Sevanson, Marysville.
"	538	Display of ladies' under-garments, linen embroidery and hand-sewing	Mrs. H. Cronkite, Sacramento.
"	540	Two sea moss pictures	Emily Thompson, age ten years, Sacramento.
"	541	One netted tidy	Emily Thompson, age ten years, Sacramento.
"	542	Three pieces point lace made by hand	Miss M. Cargill, Oakland.
		One parasol	Miss M. Cargill, Oakland.
		One fan cover and handkerchief	Miss M. Cargill. Oakland.
"	543	One calico shirt	Miss Georgia Wilburn, Sacramento.
"	544	One calico shirt	Miss Mattie George, Sacramento.
"	545	One feather bouquet and basket	Miss Lillie Coons, Elk Grove.
"	547	One crochet tidy	Mrs. D. W. Campbell, Sacramento.
"	559	Four buggy robes	D. H. Quinn, Sacramento.
"	560	One hundred and ten quilt blocks	Nellie Green, age seven years, Sacramento.
"	566	Best display of children's and ladies' clothing, California made.	Michael Kraker, Sacramento.
"	567	Best fancy chair cushion and back	Michael Kraker, Sacramento.
	568	Best silk embroidery	Michael Kraker, Sacramento.
"	569	Best embroidered sofa cushion	Michael Kraker, Sacramento.
"	570	Best embroidered children's clothes	Michael Kraker, Sacramento.
"	571	Best embroidered handkerchief	Michael Kraker, Sacramento.
"	572	Best variety linen embroidery	Michael Kraker, Sacramento.
"	573	One tidy	Mrs. J. H. Carroll, Sacramento.
"	454	One bouquet wax flowers	Agnes Hammel, Sacramento.
"	258	Three fancy quilts	Mrs. R. H. Byers, Sacramento.
"	286	Two patchwork quilts	Mrs. R. H. Byers, Sacramento.
"	228	One patchwork quilt	Mrs. G. G. Morgan, Sacramento.
"	299	One log cabin quilt	Miss Nancy C. Jackson, fourteen years old, Elk Grove.
"	361	Five quilts—one white, one log cabin, one California garden, one cherry tree, and one wreath of roses	Mrs. James Lansing (for Mrs. C. C. Otis), Sacramento.
"	363	One patchwork quilt	Miss Ellen Lansing, Sacramento.
"	373	One log cabin quilt	Mrs. O. S. Freeman, Elk Grove.
"	403	One worsted quilt (quail-trap)	Mrs. R. H. Byers, Sacramento.
"	481	One patchwork quilt	Mrs. Wm. Green, Jr., Mountain Springs, Amador.
"	539	One worked quilt	Mrs. H. Cronkite, Sacramento.

FOURTH DEPARTMENT.

CLASS I.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 13, 1873.	1	Two Diebold & Kienzle's burglar and fireproof safes	Bryant & Taylor, San Francisco.
"	2	One Diebold & Kienzle's burglar and fireproof safe	Bryant & Taylor, San Francisco.
"	3	Four Diebold & Kienzle's fireproof safes	Bryant & Taylor, San Francisco.
Sept. 15, 1873.	4	One lot tinware	H. Van Every, Sacramento.
"	5	One lot brass goods	Huntington, Hopkins & Co., Sacramento.
"	6	One lot hatchets and axes	Huntington, Hopkins & Co., Sacramento.
"	7	One lot locks	Huntington, Hopkins & Co., Sacramento.
"	8	One lot door trimmings	Huntington, Hopkins & Co., Sacramento.
"	9	One lot window trimmings	Huntington, Hopkins & Co., Sacramento.
"	10	One lot shutter trimmings	Huntington, Hopkins & Co., Sacramento.
"	11	One lot general hardware	Huntington, Hopkins & Co., Sacramento.
"	12	One lot iron and steel	Huntington, Hopkins & Co., Sacramento.
"	13	One lot mechanics' tools	Huntington, Hopkins & Co., Sacramento.
"	14	One lot table cutlery	Huntington, Hopkins & Co., Sacramento.
"	15	One lot pocket cutlery	Huntington, Hopkins & Co., Sacramento.
"	16	One lot circular saws	Huntington, Hopkins & Co., Sacramento.
"	17	One lot mill saws	Huntington, Hopkins & Co., Sacramento.
"	18	One lot hand saws	Huntington, Hopkins & Co., Sacramento.
"	19	One lot files	Huntington, Hopkins & Co., Sacramento.
"	20	One lot pruning shears	Huntington, Hopkins & Co., Sacramento.
"	21	One lot pruning knives	Huntington, Hopkins & Co., Sacramento.
"	22	One lot anti-friction metal	Huntington, Hopkins & Co., Sacramento.
"	23	One lot shot	Huntington, Hopkins & Co., Sacramento.
"	24	One lot pruning shears	T. B. Stevens, Sacramento.
"	25	Display of cutlery (home manufacture) upper hall	J. J. Cass, Sacramento.
"	26	Three pruning shears, upper hall.	J. J. Cass, Sacramento.
"	27	Display of cutlery, upper hall	J. J. Cass, Sacramento.
"	28	Display of brass work (California manufacture)	Adams, Wadsworth & Co., Sacramento.
"	29	Display of locks (California manufacture)	Adams, Wadsworth & Co., Sacramento.

CLASS I—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 16, 1873.	30	Eighteen chandeliers, upper hall.	David Bush, Sacramento.
"	31	Eleven portable and one globe, upper hall	David Bush, Sacramento.
"	32	Two burglar and fireproof safes	Hall's Safe and Lock Co., San Francisco.
"	33	Two burglar and fireproof safes	Hall's Safe and Lock Co., San Francisco.
"	34	Two fireproof safes	Hall's Safe and Lock Co., San Francisco.
"	35	Display of locks	Hall's Safe and Lock Co., San Francisco.
"	37	One lot tinware and stove furniture	R. C. Terry & Co., Sacramento.
"	38	One lot chandeliers and burners.	R. C. Terry & Co., Sacramento.
"	39	One glass chandelier, reflecting	R. C. Terry & Co., Sacramento.
"	40	One lot street lanterns	R. C. Terry & Co., Sacramento.
"	41	Display of silverware	R. C. Terry & Co., Sacramento.
"	44	One McNeale & Urban's fireproof safe	G. A. Raymond, San Francisco.
"	45 to 55 inc.	Display of lamps, stands, and shades, upper hall	J. L. Merrill, San Francisco.

CLASS II.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	1	One Norman cooking range	H. Van Every, Sacramento.
"	2	One new home-comfort cooking stove	H. Van Every, Sacramento.
"	3	Three parlor stoves	H. Van Every, Sacramento.
Sept. 16, 1873.	4	One French range, broiler, frier, and hot water attachment	R. C. Terry & Co., Sacramento.
"	5	Two Richmond portable ranges for wood	R. C. Terry & Co., Sacramento.
"	6	One Richmond palace range for coal	R. C. Terry & Co., Sacramento.
"	7	One Richmond hot air furnace	R. C. Terry & Co., Sacramento.
"	8	One Keyser portable heater	R. C. Terry & Co., Sacramento.
"	9	One laundry queen.	R. C. Terry & Co., Sacramento.
"	10	One gas log and grate for parlor.	R. C. Terry & Co., Sacramento.
"	11	One lot gas stoves	R. C. Terry & Co., Sacramento.
"	12	One lot ornamental statuary	R. C. Terry & Co., Sacramento.
"	13	One lot ornamental iron vases	R. C. Terry & Co., Sacramento.
"	14	One lot Japanese ware	R. C. Terry & Co., Sacramento.

CLASS III.—MUSICAL INSTRUMENTS, CABINET WARE (CALIFORNIA MANUFACTURE.)

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 13, 1873.	15	One orchestral grand piano	Wm. G. Badger (Hallet, Davis & Co.'s pianos), San Francisco.
"	16	One square piano, No. 2	Wm. G. Badger (Hallet, Davis & Co.'s pianos), San Francisco.
"	17	One square grand piano, No. 7	Wm. G. Badger (Hallet, Davis & Co.'s pianos), San Francisco.
"	18	Two square grand pianos, No. 8.	Wm. G. Badger (Hallet, Davis & Co.'s pianos), San Francisco.
"	19	One square grand piano, No. 9	Wm. G. Badger (Hallet, Davis & Co.'s pianos), San Francisco.
"	20	Six Geo. Woods & Co.'s organs, Nos. 22, 50, 44, 26, 15, grand, and one bijou	Wm. G. Badger, San Francisco.
"	21	One double base, by George Southwell (man seventy-two years old)	Wm. G. Badger, San Francisco.
"	49	One chamber set	A. T. Sherwood & Co., Sacramento.
"	50	One extension cot	A. T. Sherwood & Co., Sacramento.
"	51	One elastic bed	A. T. Sherwood & Co., Sacramento.
"	52	One hospital bed	A. T. Sherwood & Co., Sacramento.
"	81	Five varieties racks—clothes, book, towel, flower, and toilet.	E. C. Smith, Sacramento.
"	128	One inlaid center table	Sam. McMullen, Lodi, San Joaquin County.
"	173	Two wire spring beds	J. Campbell, Sacramento.
"	228	One spring bed (guests equalized)	G. L. Powell, Sacramento.
"	229	One imitation California laurel, birdseye-maple, and black walnut door	J. Driscoll, Sacramento.
"	238	Four spring beds (Reeder's patent)	C. V. Reeder, San José.
"	277	Two Crandall spring beds	Cooley & Green, Sacramento.
"	278	One Libby & Swett's grand gothic No. 1 school desk	A. McEwen, Sacramento.
"	236	One bed spring	W. L. Manor, Cacheville, Yolo County.
"	404	One center table	Goodwin & Co., San Francisco.
"	405	One parlor set	Goodwin & Co., San Francisco.
"	406	Display of upholstery	Goodwin & Co., San Francisco.
"	407	One grand piano	Hazelton & Bros., Chas. S. Eaton, agent, San Francisco.
"	408	Two square grand pianos	Hazelton & Bros., Chas. S. Eaton, agent, San Francisco.
"	409	One parlor square piano	Hazelton & Bros., Chas. S. Eaton, agent, San Francisco.
"	410	Two vestry organs (Estey, maker)	Hazelton & Bros., Chas. S. Eaton, agent, San Francisco.
"	411	Two parlor organs (Estey, maker)	Hazelton & Bros., Chas. S. Eaton, agent, San Francisco.
"	419	Best dressing bureau	John Breuner, Sacramento.
"	420	Best sofa	John Breuner, Sacramento.
"	421	Best lounge	John Breuner, Sacramento.
"	422	Best extension table	John Breuner, Sacramento.
"	423	Best office chair	John Breuner, Sacramento.
"	424	One side table	John Breuner, Sacramento.

CLASS III—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 13, 1873.	425	Best parlor furniture	John Breuner, Sacramento.
"	426	Best display of furniture	John Breuner, Sacramento.
"	427	Best book case	John Breuner, Sacramento.
"	428	Best wardrobe	John Breuner, Sacramento.
"	429	Best set bedroom furniture	John Breuner, Sacramento.
"	430	Best display of upholstery	John Breuner, Sacramento.
"	431	Best office desk	John Breuner, Sacramento.
"	432	Best writing desk	John Breuner, Sacramento.
"	512	One sick chair	John Breuner, Sacramento.
"	476	Two sick chairs	Dale & Co., Sacramento.
"	534	Four carved and gilt walnut frames	C. H. Krebs, Sacramento.
"	548	One concert grand Weber piano.	Sherman & Hyde, San Francisco.
"	549	Two square grand Weber pianos.	Sherman & Hyde, San Francisco.
"	550	One square Weber piano	Sherman & Hyde, San Francisco.
"	551	One square Weber piano	Sherman & Hyde, San Francisco.
"	576	Two portable tables and one toy table (patented)	Eureka Portable Table Co.; St. Louis, Mo., G. W. Swasey, agent, San Francisco.

CLASS IV.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	1	Display cedar ware	Nichols & Co., Sacramento.
"	2	Display pine ware	Nichols & Co., Sacramento.
"	3	Display oak ware	Nichols & Co., Sacramento.
"	4	Display willow ware	Nichols & Co., Sacramento.
"	5	Display splitwood baskets	Nichols & Co., Sacramento.
"	6	Display osier willows	Nichols & Co., Sacramento.
"	7	Display wooden ware	Nichols & Co., Sacramento.
"	8	Exhibition broomcorn, brooms, and brushes	Nichols & Co., Sacramento.
"	9	Assortment hair brushes	Nichols & Co., Sacramento.
"	10	Assortment coopers' ware	Nichols & Co., Sacramento.
"	11	Assortment of hair brushes	San Francisco Brush Factory, San Francisco.
"	12	Display of pine ware	Barnes & Barber, Sacramento.

CLASS VI.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	1	One lot stove polish	Huntington, Hopkins & Co., Sacramento.
Sept. 16, 1873.	2	Lot Averill chemical paint	California Chemical Paint Company, San Francisco.

CLASS VII.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 13, 1873.	1	Collection of manufactured marble	Manhattan Marble Company, San Francisco.
Sept. 15, 1873.	2	Display of California marble	Aitken & Luce, Sacramento.
Sept. 16, 1873.	3	One lot stone ware	N. Clark & Co., Sacramento.
"	4	One lot earthern ware	N. Clark & Co., Sacramento.
"	5	One lot terracotta	N. Clark & Co., Sacramento.
"	6	One lot drain tile	N. Clark & Co., Sacramento.
"	7	One lot sewer pipe	N. Clark & Co., Sacramento.
"	8	One lot stove linings	N. Clark & Co., Sacramento.
"	9	One lot fire bricks	N. Clark & Co., Sacramento.
"	10	Display assorted glassware	California Glass Manufacturing Co., San Francisco.
"	11	Display bottle glass	California Glass Manufacturing Co., San Francisco.
"	12	Green bottle glass	California Glass Manufacturing Co., San Francisco.
"	13	Tincture and other stoppered bottles and vials	California Glass Manufacturing Co., San Francisco.
"	14	Demijohns	California Glass Manufacturing Co., San Francisco.

CLASS VIII.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	193	Cinnibar from the California Quicksilver Mine, near Knoxville, Yolo County, Cal	C. P. Wheeler, Sacramento.

FIFTH DEPARTMENT.

CLASS II.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 14, 1873.	1	Two bushels white Australian wheat	Marion Biggs, Biggs' Station.
"	2	Sample Chevalier barley	Marion Biggs, Biggs' Station.
"	3	Sample Nepul barley	Marion Biggs, Biggs' Station.
Sept. 15, 1873.	4	One bale of hops	R. J. Merkley, Sacramento.
"	5	One pole of hops.	R. J. Merkley, Sacramento.
"	6	One sack wheat, Pride of Butte	Wm. Van Wert, Nord.
"	7	One sack flour	J. L. Keefer, Nord.
"	8	One sack Tappahannock wheat	Thos. L. Chamberlain, Lincoln.
Sept. 16, 1873.	9	Two sacks sugar beet seed	John Smith, Sacramento.
"	10	One bushel white corn	F. H. Fisher, Sacramento.
"	11	One bushel yellow corn	F. H. Fisher, Sacramento.
"	12	One bale of hops	Joseph Putnam, Lockford.
"	13	One bale-bag Dale hops	D. Lewis, Los Angeles.

CLASS III.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	1	Two dozen mammoth sweet corn	J. H. Parr, Brighton.
“	2	Half dozen custard squashes	J. H. Parr, Brighton.
“	3	Half dozen pumpkins	J. H. Parr, Brighton.
“	4	Watermelons	J. H. Parr, Brighton.
“	5	Half dozen ice cream watermelons	John Studarus, Brighton.
“	6	Half dozen ears of corn	N. H. Dixon, Cosumnes.
“	7	Half bushel of red potatoes	P. Burns, Sacramento.
“	8	Half peck white potatoes, Mountain Lily	P. Burns, Sacramento.
“	9	Variety Irish potatoes	P. Burns, Sacramento.
“	10	Half peck potatoes, Queen of Valley	P. Burns, Sacramento.
“	11	Half peck of potatoes, Early Goodrich	P. Burns, Sacramento.
“	12	Half peck of potatoes, Early Rose, No. 2	P. Burns, Sacramento.
“	13	Half peck of potatoes, Neshannock	P. Burns, Sacramento.
“	14	Half peck of potatoes, Early Rose, five weeks growth.	P. Burns, Sacramento.
“	15	Half peck of potatoes, Peachblow	P. Burns, Sacramento.
“	16	Six sugar beets	P. Burns, Sacramento.
“	17	Three stalks Central American sugar cane	Mark Hopkins, Sacramento.
“	18	Table of vegetables	DeBernardi & Selna, Sacramento.
“	19	Half barrel Peachblow potatoes.	S. Cole, Gilroy.
“	20	Half peck mountain peppers	J. H. Carrington, Florin.
“	21	Half peck cayenne peppers	J. H. Carrington, Florin.
“	22	Six white Cylesian sugar beets	C. N. Hoit, Sacramento.
“	23	Three green-fleshed muskmelons	C. N. Hoit, Sacramento.
“	24	Half bushel Peerless potatoes	Jacob Lyon, Placerville.
“	25	Three Valparaiso squashes	J. H. Parr, Brighton.
“	26	Twelve parsnips	F. Gabrielle & Co., Sacramento.
“	27	Twelve carrots	F. Gabrielle & Co., Sacramento.
“	28	Six long blood beets	F. Gabrielle & Co., Sacramento.
“	29	Six turnip beets	F. Gabrielle & Co., Sacramento.
“	30	Six sugar beets	F. Gabrielle & Co., Sacramento.
“	31	One peck tomatoes	F. Gabrielle & Co., Sacramento.
“	32	Six drumhead cabbages	F. Gabrielle & Co., Sacramento.
“	33	Six red Dutch cabbages	F. Gabrielle & Co., Sacramento.
“	34	Six varieties cabbages	F. Gabrielle & Co., Sacramento.
“	35	Three heads cauliflowers	F. Gabrielle & Co., Sacramento.
“	36	Three heads broccoli	F. Gabrielle & Co., Sacramento.
“	37	Six heads lettuce	F. Gabrielle & Co., Sacramento.
“	38	Half peck red onions	F. Gabrielle & Co., Sacramento.
“	39	Half peck white onions	F. Gabrielle & Co., Sacramento.
“	40	Half peck yellow onions	F. Gabrielle & Co., Sacramento.
“	41	Half peck peppers	F. Gabrielle & Co., Sacramento.
“	42	Twelve roots salsify	F. Gabrielle & Co., Sacramento.
“	43	Six stalks celery	F. Gabrielle & Co., Sacramento.
“	44	Six marrow squashes	F. Gabrielle & Co., Sacramento.
“	45	Large pumpkin	F. Gabrielle & Co., Sacramento.
“	46	Six Hubbard squashes	F. Gabrielle & Co., Sacramento.
“	47	Three Long Island watermelons.	J. H. Parr, Brighton.
“	48	One dozen sweet corn	F. Gabrielle & Co., Sacramento.
“	49	Half dozen cucumbers	F. Gabrielle & Co., Sacramento.
“	50	Half peck Lima beans	F. Gabrielle & Co., Sacramento.
“	51	Half peck pole beans	F. Gabrielle & Co., Sacramento.
“	52	Table of vegetables	F. Gabrielle & Co., Sacramento.
“	53	Fourteen varieties of peas	J. H. Aiken, Sacramento.
“	54	One peck castor oil peas	J. H. Aiken, Sacramento.

CLASS III—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	55	One peck field peas	J. H. Aiken, Sacramento.
“	56	One peck garden peas	J. H. Aiken, Sacramento.
“	57	Six Valparaiso squashes	John H. Woolf, Brighton.
“	58	Six marrowfat squashes	John H. Woolf, Brighton.
“	59	Six crook-neck squashes	John H. Woolf, Brighton.
“	60	Three Mountain Sweet melons	John H. Woolf, Brighton.
“	61	Six French-netted cantaloupes	John H. Woolf, Brighton.
“	62	Six Boston marrow squashes	Robert Williamson, Sacramento.
“	63	Six Hubbard squashes	Robert Williamson, Sacramento.
“	64	Six crook-neck squashes	Robert Williamson, Sacramento.
“	65	Six carrots	Robert Williamson, Sacramento.
“	66	One peck tomatoes	John Smith, Sacramento.
“	67	Six sugar beets	John Smith, Sacramento.
“	68	Six Yankee pumpkins	T. H. Fisher, Sacramento.
“	69	Fifteen ears mammoth sweet corn	T. K. Stewart, Sacramento.
“	70	Six stalks pop corn, with eighteen ears	T. K. Stewart, Sacramento.
“	71	Six red turnip beets	T. K. Stewart, Sacramento.
“	72	Half peck pole beans	T. K. Stewart, Sacramento.
“	73	One bushel yellow corn	Robert Cowne, Sacramento.
“	74	One dozen sweet corn	P. Burns, Sacramento.

CLASS IV—FLOWERS.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	182	Collection of ornamental foliage plants.	Mark Hopkins, Sacramento.
“	183	Collection of plants suitable for greenhouse, conservatory, and window culture	Mark Hopkins, Sacramento.
“	200	Collection of Australian plants	A. Ebel, Sacramento.
“	201	Collection of new and rare plants	A. Ebel, Sacramento.
“	251	One night-blooming cereus	Thos. O'Brien, Sacramento.
“	265	Best collection of flowering plants in bloom	Miller & Sievers, San Francisco.
“	266	Best collection of ornamental foliage plants	Miller & Sievers, San Francisco.
“	267	Best collection of new and rare plants	Miller & Sievers, San Francisco.
“	268	Best collection of roses in bloom	Miller & Sievers, San Francisco.
“	269	Best collection of fuschias in bloom	Miller & Sievers, San Francisco.
“	270	Best collection of cut flowers	Miller & Sievers, San Francisco.
“	271	Best display bouquets	Miller & Sievers, San Francisco.
“	272	Best collection of plants suitable for greenhouse, conservatory and window culture	Miller & Sievers, San Francisco.
“	273	Best display of hanging baskets containing plants	Miller & Sievers, San Francisco.

CLASS V.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	1	Four cheeses, under one year old.	E. T. Slight, Gilroy.
"	2	One lot cheese under one year old	S. Cole, Gilroy.
"	3	Best and largest display of cheese	S. Cole, Gilroy.

CLASS VI.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	1	Ten-pound roll butter	William Johnson, Richland.
"	2	Soda biscuit	Miss S. M. Burns, Sacramento.
"	3	Domestic corn bread	Miss S. M. Burns, Sacramento.
"	4	Domestic rye bread	Miss S. M. Burns, Sacramento.
"	5	Domestic brown bread	Miss S. M. Burns, Sacramento.
"	6	Domestic wheat bread	Miss C. E. Burns, Sacramento.
"	7	Ten-pound roll butter	Miss C. E. Burns, Sacramento.
"	8	One lot roll butter	James F. Black, Pleasanton.
"	9	Two kinds wheat biscuit	Mrs. M. Wilson, Sacramento.
"	10	One kind wheat bread	Mrs. M. Wilson, Sacramento.
"	11	One kind rye bread	Mrs. M. Wilson, Sacramento.
Sept. 16, 1873.	12	Domestic brown bread	Mrs. E. T. Aiken, Sacramento.
"	13	Domestic corn bread	Mrs. E. T. Aiken, Sacramento.
"	14	Jar thirty-five pounds butter six months old	Mrs. A. C. Cowne, Sacramento.
"	15	Domestic wheat bread	Miss G. Gerrish, Sacramento.
"	16	Soda biscuit	Miss G. Gerrish, Sacramento.
"	17	Domestic brown bread	Miss E. Hartwell (ten years of age), Sacramento.
"	18	Jar forty pounds butter over three months old	Mrs. J. P. Odbert, Sacramento.
"	19	Ten-pound roll butter	Mrs. J. P. Odbert, Sacramento.
"	20	Soda biscuit	Mrs. J. P. Odbert, Sacramento.
"	21	Domestic wheat bread	Miss A. Odbert (nine years of age), Sacramento.
"	22	Ten-pound roll butter	Mrs. H. Cronkite, Sacramento.
"	23	Domestic wheat bread	Miss E. Thompson (ten years of age), Sacramento.

CLASS VII—HONEY, PRESERVES, PICKLES, ETC.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	161	Honey	J. Archer, Sacramento.
"	163	Forty-two varieties jellies	Mrs. J. P. Odbert, Sacramento.
"	164	Thirty-two varieties canned fruits	Mrs. J. P. Odbert, Sacramento.
"	165	Forty varieties pickles	Mrs. J. P. Odbert, Sacramento.
"	166	Thirty-one varieties preserved fruits	Mrs. J. P. Odbert, Sacramento.
"	167	Two jars brandied peaches	Mrs. J. P. Odbert, Sacramento.
"	168	Two jars brandied pears	Mrs. J. P. Odbert, Sacramento.
"	175	Four varieties catsup	Mrs. J. P. Odbert, Sacramento.
"	199	Four varieties sugar, in boxes, and three loaves	California Beet Sugar Company, San Francisco.

SIXTH DEPARTMENT.

CLASS I—GREEN FRUIT.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	75	One variety seedling peaches (clingstone); first crop, tree three years from the seed	S. H. Gerrish, Sacramento.
"	76	One variety quinces	S. H. Gerrish, Sacramento.
"	77	One variety pomegranate	S. H. Gerrish, Sacramento.
"	78	One variety opuntia occidentalis, or prickly pear	S. H. Gerrish, Sacramento.
"	79	One variety clingstone peaches	C. W. Adams, Sacramento.
"	142	One variety clingstone peaches	W. H. Dixon, Cosumnes.
"	143	One variety persimmons	W. H. Dixon, Cosumnes.
"	185	Six varieties freestone budded peaches	Thos. Millgate, Sacramento.
"	186	One variety clingstone budded peaches	Thos. Millgate, Sacramento.
"	187	Four varieties freestone seedling peaches	Thos. Millgate, Sacramento.
"	188	One variety clingstone seedling peaches	Thos. Millgate, Sacramento.
"	202	One variety pomegranates	A. Ebel, Sacramento.
"	224	Thirty varieties apples	A. S. Greenlaw, Sacramento.
"	225	One variety quinces	A. S. Greenlaw, Sacramento.
"	229	Eighteen varieties apples	Jacob Lyon, Placerville.
"	230	Four varieties pears	Jacob Lyon, Placerville.
"	231	One variety seedling peaches (clingstone.)	Jacob Lyon, Placerville.
"	240	Two varieties pears	C. W. Hoyt, Sacramento.
"	241	One variety figs	C. W. Hoyt, Sacramento.
"	242	One variety peaches (George's late cling)	C. W. Hoyt, Sacramento.
"	248	Nine varieties apples	J. H. Carrington, Florin, Sacramento county.

CLASS I—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	249	Three varieties peaches (heart cling, yellow cling, and Smith's free.)	J. H. Carrington, Florin, Sacramento county.
"	250	One variety pears	J. H. Carrington, Florin, Sacramento county.
"	252	Thirty-five varieties apples	C. W. Reed, Washington, Yolo county.
"	253	Thirty varieties pears	C. W. Reed, Washington, Yolo county.
"	254	Two varieties quinces	C. W. Reed, Washington, Yolo county,
"	255	One variety pomegranates	C. W. Reed, Washington, Yolo county.
"	259	Fifty-one varieties apples	Robert Williamson, Sacramento.
"	260	Eleven varieties seedling apples.	Robert Williamson, Sacramento.
"	261	Six varieties peaches—Ward's late free, Heath's cling, Snooks' free, Smith's late cling seedling, George's late cling seedling, Cotts' favorite seedling	Robert Williamson, Sacramento.

CLASS II—DRIED AND PRESERVED FRUITS, NUTS, ETC.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873	82	Languedoc soft-shell almonds, growth of 1870, 1871, 1872	B. D. T. Clough, Centerville, Alameda.
"	83	Soft-shell almonds on the bush, growth of 1873	B. D. T. Clough, Centerville, Alameda.
"	159	One case dried fruits, thirty-one varieties	J. Archer, Sacramento County (South Haven Pomological Society, South Haven, Mich.)
"	243	Italian chestnuts	C. W. Hoit, Sacramento.
"	244	One cluster apples, a curiosity	C. W. Hoit, Sacramento.
"	256	Dried peaches	C. W. Reed, Washington, Yolo County.
"	257	Dried pears	C. W. Reed, Washington, Yolo County.
"	258	Dried nectarines	C. W. Reed, Washington, Yolo County.
"	262	Two varieties almonds	Robert Williamson, Sacramento.
"	1	Package for shipping small fruits	Barnes & Barber, Sacramento.
"	2	Package for shipping grapes	Barnes & Barber, Sacramento.
"	3	Package for shipping peaches	Barnes & Barber, Sacramento.
"	4	Package for shipping plums	Barnes & Barber, Sacramento.
"	5	Package for shipping pears	Barnes & Barber, Sacramento.

SEVENTH DEPARTMENT.

CLASS I—FINE ARTS.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 13, 1873.	9	Two pen drawings, bunch of plums, bunch of cherries, and peach blossoms	Stella Sheppard, San Francisco.
"	12	Two Roman paintings	Mrs. L. L. Landerkin, Sacramento.
"	13	One photograph (twin sisters)	Mrs. L. L. Landerkin, Sacramento.
"	22	Seven oil paintings	Miss Mary McConnell, Georgetown, El Dorado County.
"	23	Two pencil sketches	Miss Mary McConnell, Georgetown, El Dorado County.
"	39	One Oriental painting	Mrs. M. E. Miller, Sacramento.
"	28	Nineteen landscapes, in oil	Mrs. M. E. Hayden, Sacramento.
"	29	Three animal paintings, in oil	Mrs. M. E. Hayden, Sacramento.
"	30	Six fruit paintings, in oil	Mrs. M. E. Hayden, Sacramento.
"	31	Two flower paintings, in oil	Mrs. M. E. Hayden, Sacramento.
"	32	Two frames water color paintings, with fifteen specimens	Mrs. M. E. Hayden, Sacramento.
"	33	Ten frames water color paintings	Mrs. M. E. Hayden, Sacramento.
"	74	Nine pencil and crayon drawings—Farm of William J. Clark, Yolo County; General R. E. Lee; residence of John Wohlfrom, Yolo County; Black Ralph, Knight's Landing; Ned, Charley, and his dog; Jimmy Long	Andrew P. Hill, Knight's Landing, Yolo County.
Sept. 15, 1873.	107	One pen drawing	E. C. Atkinson, Sacramento.
"	108	One piece ornamental penmanship	E. C. Atkinson, Sacramento.
"	109	One piece ornamental and flourishing penmanship	E. C. Atkinson, Sacramento.
"	110	One frame card writing	E. C. Atkinson, Sacramento.
"	111	Six specimens penmanship	E. C. Atkinson, Sacramento.
"	148	Display of wood engravings, and designs for same	Lelia Curtis & Co., San Francisco.
"	162	Painting on China—One round dish, one tea set, one plate bouquets, one China tray, six mugs, one candlestick, two cake plates, several likenesses, one sugar bowl, and one teapot	R. Samisch, San Francisco.
"	180	One animal painting, in oil	Mrs. Maria Pacheco, San Quentin.
"	195	Three marine paintings in oil	Wm. A. Coulten, San Francisco.
"	196	One figure painting in oil, taken from life	Wm. Hahn, San Francisco.
"	197	One animal painting in oil	Wm. Hahn, San Francisco.
"	198	One still-life painting in oil	Wm. Hahn, San Francisco.
"	232	Five landscapes in oil	Mrs. Henry Van Husen, Sacramento.
"	233	One life-size photograph in water colors	Mrs. Henry Van Husen, Sacramento.

CLASS I—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	234	Two photographs retouched in india ink	Mrs. Henry Van Husen, Sacramento.
"	235	One crayon drawing	Mrs. Henry Van Husen, Sacramento.
"	236	One pencil drawing	Mrs. Henry Van Husen, Sacramento.
"	237	One frame tinted photograph	Mrs. Henry Van Husen, Sacramento.
"	239	One pencil drawing	Mrs. Katie Allmond, Sacramento.
"	245	Nine pencil drawings, by her pupils	Mrs. E. C. Bingay, Sacramento.
"	246	One water-color painting (head).	Mrs. E. C. Bingay, Sacramento.

CLASS II.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	1	Three Vermont statuary mantels	Aitken & Luce, Sacramento.
"	2	One Vermont statuary monument	Aitken & Luce, Sacramento.
"	3	Four California marble monuments	Aitken & Luce, Sacramento.
"	4	Five plaster statuettes	Aitken & Luce, Sacramento.
"	5	Two plaster busts	Aitken & Luce, Sacramento.
"	6	Collection of marble works	Aitken & Luce, Sacramento.
"	7	Exhibition of sculpture	Aitken & Luce, Sacramento.
"	8	Exhibition of statuettes in plaster	Aitken & Luce, Sacramento.
Sept. 16, 1873.	9	Exhibition of sculpture	J. C. Devine & Bro., Sacramento.
"	10	One statuary mantel	J. C. Devine & Bro., Sacramento.
"	11	One Italian veined mantel	J. C. Devine & Bro., Sacramento.
"	12	One Italian veined headstone	J. C. Devine & Bro., Sacramento.
"	13	One Italian statuary scroll	J. C. Devine & Bro., Sacramento.
"	14	One Italian veined monument	J. C. Devine & Bro., Sacramento.
"	15	One lamb monument for child	Aitken & Luce, Sacramento.
"	16	One California marble tablet	Aitken & Luce, Sacramento.
"	17	One Vermont marble tablet	Aitken & Luce, Sacramento.
"	18	Two Italian marble vases	Aitken & Luce, Sacramento.

CLASS III—DESIGNS.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 13, 1873.	14	Model of ship and one glass case	Wm. Landerkin, Sacramento.
Sept. 15, 1873.	263	Model for fruit drying house	Robert Williamson, Sacramento.

MISCELLANEOUS ARTICLES.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 13, 1873.	42	One case, and samples of spool cotton	A. Coolot, Sacramento.
"	71	Eight Decalcomania specimens, viz: One ornamental small stand; toilet ware; glove box; writing desk, satin pincushion; satin handkerchief case; two pictures, in frames	Mrs. J. E. Cotter, Sacramento.
Sept. 15, 1873.	73	The "Chinese Invasion," edited by the exhibitor	H. J. West, San Francisco.
"	85	Assortment of handkerchief and glove boxes (Heathe's patent)	M. S. Bowdish, San Francisco.
"	102	One musical instructor	Seward & Aiken, San Francisco.
"	103	One musical sounding staff	Seward & Aiken, San Francisco.
"	145	Excelsior self-fitting chart, for cutting ladies' dresses	Miss A. C. Archer, Sacramento.
"	156	Cough and ague remedy	Dr. H. Jackson, Woodland.
"	160	One charm string, ten hundred and eighty-one buttons	Miss Nettie Winters, Solano.
"	172	Three fancy baby carriages	A. Menke, Sacramento.
"	204	Buttricks & Co.'s patterns	Mrs. D. N. Thorpe, Sacramento.
"	205	Vessel for drawing and measuring liquids	J. H. Corliss, Reno, Nevada.
"	247	Dr. J. Ball & Co.'s Eye Caps, two kinds; one for near-sightedness, and one for far or long-sightedness	Jas. Gray, Camptonville, Yuba County.
"	1	One tule horseshoe	E. N. Walton, Vallejo.
"	2	One plow sharpener	E. N. Walton, Vallejo.
"	3	Twenty-five cases (M. or L.) Dr. Henley's IXL Bitters	H. Epstein & Co., San Francisco.
"	4	Twenty-five cases (M. or L.) Royal Plain Gin	H. Epstein & Co., San Francisco.
"	5	Forty cases (M. or L.) Regulator.	Dr. Henley, San Francisco.
"	6	One wagon jack	H. N. Miner, Sacramento.
"	7	One gate or door spring	H. N. Miner, Sacramento.
"	8	One sickle grinder	Alexander Porter, Woodland.
"	9	Model of schooner	L. Koster (sixteen years of age), Sacramento.
"	10	Blasting and sporting powder	California Powder Works, San Francisco.
"	11	Hercules powder	California Powder Works, San Francisco.
"	12	One lot assorted boxes	Barnes & Barber, Sacramento.
"	13	Four rim locks	Adams, Wadsworth & Co., Sacramento.
"	14	Six mortise locks	Adams, Wadsworth & Co., Sacramento.
"	15	One flush lock	Adams, Wadsworth & Co., Sacramento.
"	16	Thirty padlocks	Adams, Wadsworth & Co., Sacramento.
"	17	Eight beer faucets	Adams, Wadsworth & Co., Sacramento.
"	18	Half dozen one and one fourth-inch meter cocks	Adams, Wadsworth & Co., Sacramento.
"	19	Half dozen one and one fourth-inch service cocks	Adams, Wadsworth & Co., Sacramento.

MISCELLANEOUS ARTICLES—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 15, 1873.	20	Half dozen three fourths inch service and meter cocks.........	Adams, Wadsworth & Co., Sacramento.
"	21	One dozen one inch hose bibbs..	Adams, Wadsworth & Co., Sacramento.
"	22	One dozen one inch hose couplings	Adams, Wadsworth & Co., Sacramento.
Sept. 16, 1873.	23	One hard wood butter box.........	Barnes & Barber, Sacramento.
"	24	One universal glazing tool.........	Woods & Lindo, San Francisco.
"	25	Lot of Cummings' nut locks....	Jas. Kip, San Francisco.
"	26	Four cases H. & L. axle grease.	Hucks & Lambert, San Francisco.
"	27	One can Godart squirrel poison.	H. Godart, Brooklyn.
"	28	One wagon jack, No. 2............	J. L. River, Hayward.
"	29	One lot Angora robes	J. Eberhard, Santa Clara.
"	30	One lot Angora skins, white......	J. Eberhard, Santa Clara.
"	31	One lot Angora skins, colored...	J. Eberhard, Santa Clara.
"	32	Two Hyde patent waterpowers for sewing machines, etc	Sawyer & Wheden, San Francisco.
"	33	One double dial Premier bank lock	Hall's Safe and Lock Co., San Francisco.
"	34	One six-tumbler Victor lock.....	Hall's Safe and Lock Co., San Francisco.
"	35	One vault door lock..................	Hall's Safe and Lock Co., San Francisco.
"	36	One fire-proof safe lock	Hall's Safe and Lock Co., San Francisco.
"	37	One double dial guard lock.......	Hall's Safe and Lock Co., San Francisco.
"	38	Two Campbell's non-explosive bellows	Baker & Hamilton, Sacramento.
"	39	One patent iron miter box.........	Huntington, Hopkins & Co., Sacramento.
"	40	Four Weston's patent deferential pully blocks.........................	Huntington, Hopkins & Co., Sacramento.
"	41	One combined universal drill and ratchet machine..............	Huntington, Hopkins & Co., Sacramento.
"	42	One traversing screw jack.........	Huntington, Hopkins & Co., Sacramento.
"	43	Display of sporting goods.........	Huntington, Hopkins & Co., Sacramento.
"	45	One immovable cash box..........	Bryant & Taylor, San Francisco.
"	46	One fire-proof deed box............	Bryant & Taylor, San Francisco.
"	47	One Yale double dial combination lock..................................	Bryant & Taylor, San Francisco.
"	48	One Deibold & Kienzer combination lock.................................	Bryant & Taylor, San Francisco.
"	49	One Lad's gate fixture..............	Bryant & Taylor, San Francisco.
"	50	Forty bird cages........................	Dale & Co., Sacramento.
"	51	Six willow nursery chairs.........	Dale & Co., Sacramento.
"	52	One Kaffider fire regulator.......	W. W. Bolton, Jacksonville, Oregon.
"	53	One patent finger bar for harvesters	C. A. Smith, Dixon.
"	54	Woolsey's portable water heater (a California invention and manufacture)	J. S. Woolsey, Gilroy.
"	55	Woolsey's patent cheese vat......	J. S. Woolsey, Gilroy.

MISCELLANEOUS ARTICLES—Continued.

Date.	No. Entry.	ARTICLE.	Name and Post Office address of exhibitor.
Sept. 17, 1873	56	Patent hydraulic nozzle............	E. M. Wright, Marysville.
"	57	Four samples of wool................	Wm. Wilkinson, Sacramento.
"	58	One locomotive Champion cup..	Peter Milich, Virginia City.
"	59	Two lubricating Champion cups	Peter Milich, Virginia City.
"	60	Section of railroad rail of wood..	I. C. Woods, San Francisco.
"	61	Six fluting sadirons.................	Weister & Co., San Francisco.
Sept. 18, 1873	62	Model of patent fence...............	C. W. Reeder, San José.
Sept. 16, 1873	63	One double-action press and hoisting machine....................	B. Essex, Sacramento.
"	64	One McNeale & Urban's Perfection bank lock.....	G. A. Raymond, San Francisco.
"	65	One vegetable cutter, coffee grinder, and knife sharpener combined.	B. Essex, Sacramento.

CHILDREN'S WORK.

To the honorable Board of State Agriculture:

GENTLEMEN: Your Committee on Needlework, etc., would respectfully represent: That in the premium list there are no premiums offered for the work and skill of the juvenile portion of our population in this State; and we further represent, that these young people will, at some day not far distant, occupy positions of responsibility, now held by your honorable body and others, and sincerely hope that you will establish a juvenile department in the State Fair, and award to them this year special premiums, as follows, to wit:

Miss Detering—Feather wreath.
Katie Studarus, age, thirteen years—Wax wreath.
Mabel Alden, age, four years—Baby quilt.
Katie Stephens—Autumn leaves.
Martha Groth, age, eight years—Worsted picture.
Nellie Winters, age, nine years—Charm string of one thousand and eighty-one buttons.
Miss Joseph, age, thirteen years—Hair wreath.
Georgia Wilburn, age, fourteen years—One hand-made gentleman's shirt.
Mattie George, age, fourteen years—One hand-made gentleman's shirt.
Nellie Green, age, seven years—One hundred and ten blocks of patchwork.
Emma Tubbs—Worsted picture.
Myrtle Dickinson, age, ten years—Worsted bouquet.
Lilly Coons, age, thirteen years—Feather bouquet.

Many of the above articles possess merits not shown by exhibitors of greater experience.

Respectfully submitted.

MRS. HORACE ADAMS,
CHAS. H. WYMAN.

PREMIUMS AWARDED IN 1873.

PREMIUMS AWARDED IN 1873.

FIRST DEPARTMENT.

CLASS I—THOROUGHBRED HORSES.

Exhibitor.	Post Office.	Animal.	Premium.
Theodore Winters	Solano	Best thoroughbred stallion, four years old and over	$75
John Hall	Alameda	Best thoroughbred stallion, three years old and over	$50
James Mee	San Francisco	Best thoroughbred stallion, two years old	$40
William Boots	San Francisco	Best thoroughbred stallion, one year old	$30
William Boots	San Francisco	Best thoroughbred stallion colt, under one year	$20
Theodore Winters	Solano	Best thoroughbred mare, four years old and over, with colt	$60
John Hall	Alameda	Best thoroughbred mare, four years old and over	$50
John Hall	Alameda	Best thoroughbred mare, three years old	$40
John Hall	Alameda	Best thoroughbred mare, two years old	$30
H. Williamson	Sacramento	Best thoroughbred mare, one year old	$25
Theodore Winters	Solano	Best thoroughbred mare colt, under one year	$20
Theodore Winters	Solano	Best thorougbred sire, with not less than ten of his colts, all thoroughbred	$150
John Hall	Alameda	Best thoroughbred dam, with not less than four of her colts, all thoroughbred	$100
Wm. Hamilton	San José	Best stallion, other than thoroughbred, with not less than ten of his colts	$100
Wm. Hamilton	San José	Best dam, other than thoroughbred, with not less than three of her colts	$50

CLASS II—GRADED HORSES.

Exhibitor.	Post Office.	Animal.	Premium.
C. P. Marsh	Oakland	Best graded stallion, four years old and over	$50
C. Barney	Yolo	Best graded stallion, two years old	$30
Wm. Hamilton	San José	Best graded stallion, one year old	$20
Chas. H. Shear	Sacramento	Best graded mare, four years old and over, with colt	$50
Wm. Hamilton	San José	Best graded mare, four years old and over	$40
J. J. Smith	Yolo	Best graded mare, two years old	$20
Wm. Hamilton	San José	Best graded mare, one year old	$15
P. Mangin	Sacramento	Stallion "St. Patrick"	Diploma.

CLASS III—HORSES OF ALL WORK.

Exhibitor.	Post Office.	Animal.	Premium.
P. M. Warn	Sacramento	Best stallion of all work, four years old and over	$40
Wm. Hartley	Colusa	Best stallion of all work, three years old	$30
Wm. Hamilton	San José	Best stallion of all work, two years old	$20
Joshua Reeves	Placer	Best stallion of all work, one year old	$15
John H. Jackson	Yolo	Best mare of all work, four years old and over	$30
E. Pierce	Sacramento	Best mare of all work, four years old and over, with colt	$40
E. Pierce	Sacramento	Best mare of all work, three years old	$20
E. Pierce	Sacramento	Best mare of all work, two years old	$15

CLASS IV—DRAFT HORSES.

Exhibitor.	Post Office.	Animal.	Premium.
Massey Thomas	Gilroy	Best draft stallion, four years old and over	$40
M. L. Britton	San Mateo	Best draft stallion, three years old	$30
M. L. Britton	San Mateo	Best draft stallion, two years old	$20
John Neal	Sacramento	Best draft mare, four years old and over, with colt	$40
J. A. Evans	Sacramento	Best draft mare, four years old and over	$35
F. M. Shepler	Sacramento	Best draft mare, three years old	$25

CLASS V—ROADSTERS.

Exhibitor.	Post Office.	Animal.	Premium.
D. M. Reavis	Chico	Best roadster stallion, four years old and over	$50
J. Sessions	Alameda	Best roadster stallion, three years old	$40
Wm. Hamilton	San José	Best roadster stallion, two years old	$30
S. Harris	Oakland	Best roadster gelding, four years old and over	$40
Wm. Hamilton	San José	Best roadster mare, four years old and over	$40
Wm. Hamilton	San José	Best roadster mare, three years old	$30
L. H. Fassett	Sacramento	Best roadster mare, two years old	$20

CLASS VI—CARRIAGE HORSES.

Exhibitor.	Post Office.	Animal.	Premium.
James Roberts	Sacramento	Best match span carriage horses, owned and used as such by one person	Sil. goblet, value..$40

CLASS VII—ROADSTER TEAMS.

Exhibitor.	Post Office.	Animal.	Premium.
E. Wilson	San Francisco	Best double team roadsters, owned and used as such by one person	Sil. goblet, worth..$40

CLASS VIII—SADDLE HORSES.

Exhibitor.	Post Office.	Animal.	Premium.
Marion Biggs	Biggs' Station, Butte	Best saddle-horse, mare, or gelding	Saddle, worth..$40

CLASS IX—COLTS.

Exhibitor.	Post Office.	Animal.	Premium.
Wm. Hamilton	San José	Best yearling horse colt	$30
E. H. Miller, Jr	Sacramento	Best yearling mare colt	$20
E. Pierce	Sacramento	Best sucking horse colt	$20
John Neal	Sacramento	Best sucking mare colt	$15
Wm. Hamilton	San José	Best exhibit of not less than six colts, owned by one person, of any age or sex	$50

CLASS X—SWEEPSTAKES.

Exhibitor.	Post Office.	Animal.	Premium.
Theo. Winters	Solano	Best stallion of any age	Sil. pitcher, worth $100
John Hall	Alameda	Second best stallion of any age	Sil. pitcher, worth..$50
Theo. Winters	Solano	Best mare of any age	Sil. pitcher, worth..$75
John H. Jackson	Yolo	Second best mare of any age	Sil. pitcher, worth..$35
		Jacks.	
Marion Biggs	Biggs' Station	Best jack, three years old	$30
C. H. Wheeler	San José	Best span of mules, of any age	$25

CATTLE.

Exhibitor.	Post Office.	Animal.	Premium.
		Durham cattle.	
W. F. Gordon	Liberty, Mo	Best bull, four years old and over	$75
Vernon & Flint	San José	Best bull, three years old	$40
W. F. Gordon	Liberty, Mo.	Best bull, two years old	$30
G. W. Scott	Yolo	Best bull, one year old	$25
G. N. Sweezy	Yuba	Best bull calf	$15
Estate of Page	San Francisco	Best Durham cow, four years old and over	$50
Carr & Chapman	Gabilan	Best Durham cow, three years old	$40
G. N. Sweezy	Yuba	Best Durham cow, two years old	$30
W. F. Gordon	Liberty, Mo	Best Durham cow, one year old	$20
G. N. Sweezy	Yuba	Best Durham heifer calf	$15
		Devon cattle.	
Wm. Fleming	Napa	Best Devon bull, two years old	$30
Wm. Fleming	Napa	Best Devon cow, four years old	$50
Wm. Fleming	Napa	Best Devon heifer calf	$15

CATTLE—Continued.

Exhibitor.	Post Office.	Animal.	Premium.
		Jersey cattle.	
Robert Beck	Sacramento	Best Jersey bull, four years old and over	$75
A. Mailliard	Marin	Best Jersey bull, one year old	$25
A. Mailliard	Marin	Best Jersey cow, three years old	$40
A. Mailliard	Marin	Best Jersey cow, two years old	$30
A. Mailliard	Marin	Best Jersey cow, one year old	$20
A. Mailliard	Marin	Best Jersey heifer calf	$15
		Alderney cattle.	
A. Mailliard	Marin	Best Alderney bull, four years old and over	$75
L. J. Orcutt	Massachusetts	Best Alderney bull, three years old	$40
A. Mailliard	Marin	Best Alderney bull calf	$15
A. Mailliard	Marin	Best Alderney cow, four years old and over	$50
A. Mailliard	Marin	Best Alderney cow, three years old	$40
A. Mailliard	Marin	Best Alderney cow, one year old	$20
A. Mailliard	Marin	Best Alderney heifer calf	$15
		Ayrshire cattle.	
Robert Beck	Sacramento	Best Ayrshire bull, three years old	$40
Robert Beck	Sacramento	Best Ayrshire bull, one year old	$25
Robert Beck	Sacramento	Best Ayrshire bull, calf	$15
Robert Beck	Sacramento	Best Ayrshire cow, four years old and over	$50
L. A. Upson	Sacramento	Best Ayrshire cow, three years old	$40
Mike Bryte	Sacramento	Best Ayrshire cow, one year old	$20
L. A. Upson	Sacramento	Best Ayrshire heifer calf	$15
		Herds.	
W. F. Gordon	Liberty, Mo	Best herd of thoroughbred cattle, ten head, and not more than four males, owned by one person	Sil. pitcher, worth $150
		Graded cattle.	
Jeremiah Smith	San Mateo	Best graded bull, three years old	$30
E. Comstock	Yolo	Best graded bull, one year old	$15
C. W. Clark	Sacramento	Best graded bull calf	$10
E. C. Singletary	Colusa	Best yoke of oxen	$10
C. W. Clark	Sacramento	Best graded cow, four years old and over	$30
E. Comstock	Yolo	Best graded cow, three years old	$20
William Quin	San José	Best graded cow, two years old	$15
William Quin	San José	Best graded cow, one year old	$10
E. Comstock	Yolo	Best graded heifer calf	$10
W. F. Gordon	Liberty, Mo	Best thoroughbred bull and five of his calves	Sil. pitcher, worth $100
		Sweepstakes.	
W. F. Gordon	Liberty, Mo	Best bull of any age or breed	Sil. pitcher, worth $100
W. F. Gordon	Liberty, Mo	Second best bull of any age or breed	Sil. pitcher, worth..$50
Col. C. Younger	San José	Best cow of any age or breed	Sil. pitcher, worth..$75
G. N. Sweezy	Yuba	Second best cow of any age or breed	Sil. pitcher, worth..$35

SHEEP.

Exhibitor.	Post Office.	Animal.	Premium.
		Spanish Merino.	
Smith & Chapman.	Grayson	Best ram, two years old and over	$30
Severance & Peet		Best ram, one year and under two	$20
Fred. Cox	Sacramento	Best three ram lambs	$20
Severance & Peet		Best five ewes, two years old and over.	$20
Severance & Peet		Best five ewes, one year and under two.	$20
C. C. Baker		Best five ewe lambs	$20
		French Merino.	
H. Wilcox	Dixon	Best ram, two years old and over	$30
Smith & Chapman.	Grayson	Best ram, one year and under two	$20
Smith & Chapman.	Grayson	Best three ram lambs	$20
Robert Blacow	Alameda	Best five ewes, two years old and over.	$20
Robert Blacow	Alameda	Best five ewes, one year old and under two	$20
Robert Blacow	Alameda	Best five ewe lambs	$20
		Silesian Merino.	
S. Treat	Sacramento	Best ram, two years old and over	$30
Robert Beck	Sacramento	Best ram, one year and under two	$20
		Cotswold.	
Wm. Fleming	Napa	Best ram, two years old and over	$30
Wm. Fleming	Napa	Best three ram lambs	$20
		Grades.	
Geo. W. Hancock	Sacramento	Best five ram lambs	$20
Geo. W. Hancock	Sacramento	Best five ewes, two years old and over.	$20
Geo. W. Hancock	Sacramento	Best five ewe lambs	$15
C. C. Baker		Best Spanish merino ram and five of his lambs	$50
Smith & Chapman.	Grayson	Best French merino ram and five of his lambs	$50
		Sweepstakes.	
C. C. Baker		Best ram, of any age or breed, and five of his lambs	$75
Smith & Chapman.	Grayson	Second best ram, of any age or breed, and five of his lambs	$35

GOATS.

Exhibitor.	Post Office.	Animal.	Premium.
Thomas & Shirland	Placer County	Best thoroughbred buck, two years old and over	$30
Butterfield & Son	Monterey	Best thoroughbred buck, under two years	$20
Landrum & Rogers	Watsonville	Best pen of not less than three does, two years and over	$20
N. Gilmore	El Dorado	Best pen of not less than three does, under two years	$15
		Graded goats.	
Butterfield & Son	Hollister	Best buck, two years old and over	$25
N. Gilmore	El Dorado	Best buck, under two years	$20
Butterfield & Son	Hollister	Best pen of not less than three does, two years and over	$20
Butterfield & Son	Hollister	Best pen of not less than three does, under two years	$15
		Sweepstakes.	
N. Gilmore	El Dorado	Best buck, first premium	$50
Landrum & Rogers	Watsonville	Best doe, first premium	$25
Thomas & Shirland	Placer County	Second best doe, second premium	$15
Landrum & Rogers	Watsonville	Best pen not less than ten kids, first premium	$30
Butterfield & Son	Hollister	Best pen not less than ten kids, second premium	$15

SWINE.

Exhibitor.	Post Office.	Animal.	Premium.
R. M. Sparks	Yuba	Best boar, two years old and over	$30
P. Burns	Sacramento	Best boar, under two years	$20
R. M. Sparks	Yuba	Best boar, six months and under one year	$15
R. S. Thompson	Napa	Best breeding sow, two years old and over	$25
R. S. Thompson	Napa	Best breeding sow, one year old	$20
Jas. Moore	Sacramento	Best sow, six months and under one year	$15
R. M. Sparks	Yuba	Best pen six pigs, five months and under ten	$30
R. S. Thompson	Napa	Best pen of ten pigs of any age or breed	$30
		Sweepstakes.	
R. M. Sparks	Yuba	Best boar of any age or breed, first premium	$40
R. S. Thompson	Napa	Second best boar of any age or breed, second premium	$25

POULTRY.

Exhibitor.	Post Office.	Animal.	Premium.
Peter Burns	Sacramento	Best lot of White Dorkings	$5
Peter Burns	Sacramento	Best lot of Black Polands	$5
F. H. Miller	Sacramento	Best lot of Light Bramahs	$5
Chas. Green	Rio Vista	Best lot of English Game	$5
Andrew Greer	Sacramento	Best lot of any other distinct variety	$5
F. H. Miller	Sacramento	Best lot of any other distinct variety, (eight varieties)	$40
B. Cavanaugh	Sacramento	Best lot of any other distinct variety, Irish Game	$5
H. E. Greer	Sacramento	Best lot of turkeys	$5
Peter Burns	Sacramento	Best lot of top-knot ducks	$5
W. J. Prather	Sacramento	Best lot of Rouen ducks	$5
P. H. Fisher	Sacramento	Best lot of gray ducks	$5
Peter Burns	Sacramento	Best lot of geese—White Front	$5
R. Cowne	Sacramento	Best lot of geese—Bremen	$5
P. H. Fisher	Sacramento	Best lot of gray geese	$5
Peter Burns	Sacramento	Best variety of chickens — Royal Cochin	$5
R. Cowne	Sacramento	Best two varieties of chickens	$10
M. J. Little	Jackson	Best two varieties of chickens	$10
W. J. Prather	Woodland	Best three varieties of chickens	$15
Peter Burns	Sacramento	Best Sumatra Game	$5

SECOND DEPARTMENT.

CLASS I.

Exhibitor.	Post Office.	Article.	Premium.
Leman & Co	Dayton, Ohio	Automatic car coupling	Diploma.
H. Williams	Sacramento	Model of hoisting engine	Diploma.
R. B. Irwin & Co	San Francisco	Babcock's fire extinguisher, Nos. three to ten	Gold medal.
M. S. Bowdish	San Francisco	Whitman's portable pump, sprinkler, and fire extinguisher	Hon. mention.
Huntington, Hopkins & Co	Sacramento	Best saw gummer	$2
Jas. Pearson	Sacramento	Model of car coupling	Hon. mention.
G. R. Grant	Roseville	Lethgow fire extinguisher (Gardner's patent.)	Hon. mention.
Baker & Hamilton	Sacramento	One Ames' mounted engine	Hon. mention.
Baker & Hamilton	Sacramento	One Baxter's portable engine	Hon. mention.
A. J. Doolittle	Nevada, California, Dutch Flat Post Office	Three rock boring drills	Diploma.
R. B. Irwin & Co	San Francisco	One case of six Babcock fire extinguishers	Hon. mention.
R. B. Irwin & Co	San Francisco	One dozen combination twin nozzles	Hon. mention.

CLASSES II AND III.

Exhibitor.	Post Office.	Article.	Premium.
Baker & Hamilton	Sacramento	Best display of agricultural machines	$50
Baker & Hamilton	Sacramento	Best thrashing machine	$50
Laufkotter Bros	Sacramento	Best sweep horse power	$20
Treadwell & Co	San Francisco	Best horse rake	$10
Thomas Orchard	Sacramento	Best post auger	$5
Hawley & Co	San Francisco	Best hay cutter	$5
Huntington, Hopkins & Co	Sacramento	Best gopher trap (California manufacture)	$5
Kelly & Co	San Francisco	Best hay rake	Diploma.
M. A. Cahn	San Francisco	Best lawn sprinkler	Diploma.
McBurney	San Francisco	Best hay press	$40
McBurney	San Francisco	Bradley horse rake	Special mention.
Treadwell & Co	San Francisco	Best wheat drill	$10
W. A. Woods	San Francisco	Best reaper	$10
Kelly & Co	San Francisco	Best mower and reaper combined	Diploma.
Mattison & Williamson		Best hay fork	$5

CLASS IV.

Exhibitor.	Post Office.	Article.	Premium.
Treadwell & Co	San Francisco	Pacific grain separator	Hon. mention.
Nash, Miller & Co	Sacramento	Best fanning mill and separator	$5
M. S. Bowdish		Best feed mill	$10
Huntington, Hopkins & Co	Sacramento	Best platform scales	$5
G. L. Mason	Burlington, Vt	Best portable carriage top	Diploma.
E. C. Smith		Best milk cooler	$10
Laufkotter Bros		Best force and lift pump	$10
R. Rose		Best force and lift pump	$10
		[The committee feel unable to decide between the two above mentioned pumps, as to which process is the best for irrigating apparatus.]	
Baker & Hamilton	Sacramento	Best display of harvesting tools	Diploma.
Baker & Hamilton	Sacramento	Best mower (Buckeye)	$10
Matthew Cook	Sacramento	Best water filter	Silver medal.
J. Pool	Sacramento	Best root cutter	$5
Keller, Hine & Thomas Co	San Francisco	Best suction pump (celebrated Fluthom pump)	$10
Keller, Hine & Thomas Co	San Francisco	Perkins' patent self-regulating windmill	Diploma
A. H. Southwick		Dexter windmill (California made)	Diploma

CLASS IV—Continued.

Exhibitor.	Post Office.	Article.	Premium.
W. J. Tucker		Peck's Excelsior windmill (California made)	Diploma
W. J. Tucker		Patent fence in brace and panels	Premium recom.
W. J. Tucker		Circular fence in panels	Diploma.
E. L. Brooks	Petaluma	Farm gate	Premium recom.
Laufkotter & Co	Sacramento	Horse power and pump	$20
Laufkotter & Co	Sacramento	Double hay press	Premium recom.

We, the committee, award premiums as follows:

Perkins' patent self-regulating windmill—First premium.
The celebrated Dexter windmill—Framed diploma.
Excelsior windmill—Framed diploma.
Patent fence in brace and panels—First premium.
Circular fence in panels—Diploma.
Farm gate—First premium.
Horse power and pump—First premium.
Hay press at Park (double)—Premium.

ISAAC F. FREEMAN,
GEORGE W. LEET.

CLASS V.

Exhibitor.	Post Office.	Article.	Premium.
J. Brizee	Alvarado	Automatic clothes line and reel	$5
J. P. Henderson	Santa Clara	Sipes rubber washer	Hon. mention.
J. and J. D. Richey	Marysville	Steam washer or woman's friend	$5 and diploma.
Huntington, Hopkins Co	Sacramento	Clothes wringer	Diploma.
Mrs. E. J. Whitman.	Oakland	Whitman's kettle scraper	Silver medal.

CLASS VI—PLOWS, ETC.

Exhibitor.	Post Office.	Article.	Premium.
Baker & Hamilton	Sacramento	Best gang plow	$100
G. W. Haines	Binghamton	Best plow for stubble	$10
Mattison & Williamson	Stockton	Best sod plow (American Chief)	$10
Baker & Hamilton	Sacramento	Best steel plow (Hill's Eureka)	$10
Keller & Co	Sacramento	Meyers plow	$10
P. N. Woodworth	Petaluma	Best harrow (manufactured by A. C. Black)	$50
W. B. Taylor		Wheel adjustable harrow	Diploma.
D. A. Manuel	Napa City	Two-gang plow	Diploma.
W. B. Ready	Sacramento	Little Giant iron and frame two-gang plow	Diploma.
Mattison & Williamson	Stockton	Sulky frame gang plow	Diploma.
E. W. Walton	Vallejo	Walton gang tule plow	Diploma.
Treadwell & Co	San Francisco	California two-gang plow	Diploma.
Baker & Hamilton	Sacramento	Hill's Eureka adobe plow	Diploma.
Baker & Hamilton	Sacramento	Hill's "deep tiller"	Hon. mention.
Wm. Gutenberger	Sacramento	Best field roller and crusher.	$10 and hon. men.
Keller & Co	Sacramento	Gorham broadcast sowing machine	Diploma.
E. W. Walton	Vallejo	Best horse hoe	$5

CLASS VII.

Exhibitor.	Post Office.	Article.	Premium.
Pollard & Carvill	San Francisco	Two-horse family carriage	$30 and diploma.
Pollard & Carvill	San Francisco	One-horse family carriage	$25 and diploma.
Pollard & Carvill	San Francisco	Top buggy	$20 and diploma.
Pollard & Carvill	San Francisco	Trotting wagon	$15 and diploma.
Baker & Hamilton	Sacramento	Farm wagon, for general purposes	$15
Joseph Hill	Sacramento	Spring market wagon	$15
W. B. Ready	Sacramento	Street goods wagon	$5
W. B. Ready	Sacramento	Wagon or carriage brake	$5
A. Moffit	Washington, D.C.	Skeleton wagon	
Dale & Co	Sacramento	Carriage for children	$5
Waterhouse & Lester	Sacramento and San Francisco	Carriage wheels, hubs, etc.	$10
Waterhouse & Lester.	Sacramento and San Francisco	Carriage material and trimmings	Diploma.
Huntington, Hopkins & Co	Sacramento	Carriage springs	$10 and diploma.
Pacific Wood Preserving Co	San Francisco	Exhibition of preserved wood	Silver medal.

THIRD DEPARTMENT.

CLASS I—TEXTILE FABRICS, AND MATERIALS FROM WHICH THEY ARE MADE.

Exhibitor.	Post Office.	Article.	Premium.
Mrs. E. Vance	Sacramento	Best rag rug	$5
Mrs. K. Haas	Sacramento	Best knit pillow cover and spread	Hon. mention.
Mrs. E. Frick	Rocklin	Best rag carpet, home made.	$10
Mrs. N. A. Smith	Benicia	For one rag rug	Napkin ring.
Mrs. J. H. Haskell	Sacramento	Best knit stocking	$3
Joseph Green	Oakland	Best exhibition of silk goods.	$50
Huntington, Hopkins & Co	San Francisco	Best display of cordage	Silver medal.
Alex. McKay	San Francisco	Best display of rag carpets	$20
San José Woolen Mills	San José	Best pair woolen blankets	$5
Mrs. R. H. Byers	Sacramento	Best pair wove sheets (over one hundred years old)	Hon mention.
Capital Woolen Mills.	Sacramento	Best display of woolen goods	$50
Capital Woolen Mills.	Sacramento	Best ten yards woolen cloth.	$5
Capital Woolen Mills	Sacramento	Best ten yards cassimere	$5
Capital Woolen Mills.	Sacramento	Best ten yards jean.	$5
Capital Woolen Mills	Sacramento	Best ten yards tweed	$5
Capital Woolen Mills.	Sacramento	Best ten yards flannel	$5
Capital Woolen Mills.	Sacramento	Best Mackinac blanket	$5
Capital Woolen Mills	Sacramento	Largest and best assortment of blankets	$5
Capital Woolen Mills.	Sacramento	Best flannel shirt	Sp. prem. recom.
Mrs. Mary Sheldon	San Francisco	For one woolen carpet	$5
Mrs. H. Kuhl	Sacramento	Best pair knit drawers	$5
Mrs. H. Kuhl	Sacramento	Best two knit shirts	$5
Mrs. H. Kuhl	Sacramento	Best assortment knit goods	$5
Dale & Co	Sacramento	Best exhibit naval and military goods and regalia	Silver menal.
S. Wilzinski	Sacramento	Display bows and ties	Hon. mention.
Michael Kraker	Sacramento	Best exhibit of shoulder braces and corsets	Silver medal.
Michael Kraker	Sacramento	Largest and best display of fancy goods	$20

CLASS II.

Exhibitor.	Post Office.	Article.	Premium.
S. J. Nathan	Sacramento	Best exhibition of traveling trunks, valises, and bags	$10 and sil. medal.
Brown Bros	Sacramento	Rock River Badger State building paper	Diploma.
A. Markewitz	Sacramento	Best pair ladies' slippers	$3
M. Schink	Sacramento	Best display of saddletrees	$5
F. Foster	Sacramento	Best display of book binding	Sil. medal and $5
Dale & Co	Sacramento	Best display of paper	$5
C. H. Krebs	Sacramento	Best display of paper hangings and borders	$5
Parker & Perry	Sacramento	Best set of carriage harness	$10
Parker & Perry	Sacramento	Best set of farm harness	$10
Parker & Perry	Sacramento	Best display of saddles and bridles	$10
James Parsons	Sacramento	Best pair ladies' gaiters	$3
James Parsons	Sacramento	Best display of ladies' and girls' boots, shoes, and gaiters	Silver medal.
J. Eberhart	Santa Clara	One lot Angora robes and skins	Sil. medal and $25

CLASS III.

Exhibitor.	Post Office.	Article.	Premium.
		Silk, Worsted, and Cotton Embroidery.	
Mrs. Mary Roley	Sacramento	Best worsted embroidered picture	$10
Dale & Co	Sacramento	Worsted embroidery	Hon. mention.
Mrs. J. H. Haskell	Sacramento	One braided mat	Napkin ring.
Mrs. Mebius	Sacramento	One hearth rug	$5
Mrs. Julius Wetzlar	Sacramento	Best sofa pillow	$5
Mrs. Julius Wetzlar.	Sacramento	Toilet box	Special mention.
Mrs. Mollie Hahn	Sacramento	Best child's embroidered dress	$5
Miss Ella Lansing	Sacramento	Best silk embroidered shawl	Special mention.
Miss Ella Lansing	Sacramento	One cotton skirt	Hon. mention.
Mrs. Jas. Lansing	Sacramento	One silk embroidered picture	Special mention.
Mrs. Jas. Lansing	Sacramento	Pillows and spread of down, very fine	$5
Mrs. H. Kuhl	Sacramento	Best silk embroidery	$5
Mrs. E. A. Welty	Sacramento	Best bead embroidery	$5
S. Wilzinski	Sacramento	Best gents' white shirts	Silver mendal.
Mrs. H. M. Richards	Sacramento	Best pair braided pillow cases	$5
Mrs. S. Tryon	Sacramento	Bead work	Napkin ring.
Mrs. Spaulding	Sacramento	Worsted embroidery picture	$5
Miss J. M. Pierce	Sacramento	Best tatting collar	$3
Mrs. A. W. Stevenson	Marysville	One linen and lace skirt, very fine	$5
Mrs. Julius Wetzlar	Sacramento	Best linen embroidery	$10
Miss M. C. Cargill	Oakland	Best embroidered handkerchief	$3

CLASS III—Continued.

Exhibitor.	Post Office.	Article.	Premium.
		Wax Work.	
Mrs. J. E. Cotter	Sacramento	Best and largest collection of wax flowers	$10
Mrs. J. E. Cotter	Sacramento	Best bananas in wax	Sp. prem. recom.
Mrs. J. E. Cotter	Sacramento	Best decalcomanie	$5
Mrs. J. E. Cotter	Sacramento	Best statuary in wax	$10
Mrs. J. E. Cotter	Sacramento	Best phantom bouquets	Sp. prem. recom.
Mrs. J. E. Cotter	Sacramento	Best pair silk knit stockings	$5
Mme. Anna Getz Lucas	San Francisco	Largest and best collection of wax fruits	$10
Mme. Anna Getz Lucas	San Francisco	Best specimen wax flowers	$10
Mme. Anna Getz Lucas	San Francisco	Wax cherries	Special mention.
Mme. Anna Getz Lucas	San Francisco	Best preserved natural flowers	Silver medal.
Miss Annie Gerber	Sacramento	White cross	Napkin ring.
Miss Katy Stephens	Sacramento	Autumn leaves	Napkin ring.
Miss Katie Studarus (13 years old)	Brighton	Wax wreath	Napkin ring.
Miss Minnie Winning	Sacramento	White wax cross	Napkin ring.
Agnes Hummel	Sacramento	Bouquet wax flowers	Napkin ring.
Mrs. Stovall	San Francisco	One wax anchor and flower	
Mrs. Stovall	San Francisco	One magnolia in wax	$5
Mrs. Stovall	San Francisco	One bouquet in wax	
		Millinery, Hair, Shell, and Crochet Work, Tatting, etc.	
Mrs. S. Sims	Sacramento	Best hair wreath	$5
Mrs. J. G. Storch	Sacramento	Hair wreath	Napkin ring.
Miss J. Buser (age, thirteen years)	Sacramento	Hair wreath	Napkin ring.
Miss Julia Detering	Brighton	Hair wreath	Napkin ring.
Mrs. Wm. Gwynn	Sacramento	Paper wreath, made of old letters	Special mention.
Miss Annie Gerber	Sacramento	Hair wreath	Special mention.
Mrs. S. Sims	Sacramento	Best worsted wreath	Special mention.
Mrs. W. E. Miller	Sacramento	Worsted wreath	Special mention.
Miss Emilia Luhrs (age, fifteen years)	Sacramento	Worsted bouquet	Napkin ring.
Miss M. Dickinson (age, ten years)	Sacramento	Worsted bouquet	Napkin ring.
Katie Studarus	Brighton	Best silk wreath	Napkin ring.
Miss Mary Roley	Sacramento	Best worsted picture (Ship of State)	$5
Miss J. M. Pierce	Sacramento	Best feather wreath	$5
Miss C. Detering	Brighton	Feather wreath	Special mention.
Miss Lilly Coons	Elk Grove	Feather wreath	Special premium.
Mrs. M. A. Moorhead	Sacramento	Best sea moss wreath	$5
Miss E. Thompson (age, ten years)	Sacramento	Sea moss picture	Napkin ring.
		Millinery, etc.	
Mrs. R. W. Murphy	Sacramento	Best silk bonnet	$5
Mrs. R. W. Murphy	Sacramento	Best velvet bonnet	$5
Mrs. R. W. Murphy	Sacramento	Best artificial flowers	$10
Mrs. R. W. Murphy	Sacramento	Best display of millinery	$20
Mrs. Springer	Sacramento	Display of millinery	Special mention.

CLASS III—Continued.

Exhibitor.	Post Office.	Article.	Premium.
		Crochet and Knitted Work.	
Mrs. J. R. Wilkinson.	Sacramento	Best crochet bedspread	$5
Mrs. W. H. Milliken.	Sacramento	Best crochet lady's cape	$5
Mrs. W. H. Milliken.	Sacramento	Best crochet infant's sacque.	$2
Mrs. W. H. Milliken.	Sacramento	Java canvas toilet set	Special mention.
Miss Ella Smith	Sacramento	Java canvas tidy	Special mention.
Mrs. G. G. Morgan	Sacramento	Best ottoman cover	$5
Mrs. H. Kuhl	Sacramento	Ottoman cover	Special mention.
Mrs. H. M. Richards.	Sacramento	Ottoman cover	Special mention.
Miss J. Pierce	Sacramento	Best crochet table cover	$5
Mrs. D. W. Campbell.	Sacramento	Best crochet tidy	Napkin ring.
Mrs. L. Bruckerman.	Brooklyn	Best tatting (black silk lace)	$3
Mrs. H. Griffith	Sacramento	Knitted tidy	Napkin ring.
Mrs. A. G. Read	Woodland	Worsted sofa pillow	Special mention.
Mrs. J. H. Carroll	Sacramento	Canvas tidy	Hon. mention.
Miss Emma Tubbs	Sacramento	Tatted tidy	Napkin ring.
Mrs. W. M. Corbusier	Sacramento	Paper frames	$5
Mrs. R. Dunnavent	Sacramento	Paper whatnot	Special mention.
Mrs. H. S. Crocker	Sacramento	Linen embroidered bed set	Napkin ring.
Mrs. J. H. Carroll	Sacramento	Sofa pillow and stool cover	Napkin ring.
Mrs. J. H. Carroll	Sacramento	Toilet set	Napkin ring.
Mrs. Julius Wetzlar	Sacramento	Canvas toilet set	Special mention.
Mrs. Mebius	Sacramento	Toilet set (lace)	Special mention.
Mrs. J. Wetzlar	Sacramento	Canvas tidy	Special mention.
Miss M. C. Cargill	Oakland	Three pieces point lace, one parasol, one fan cover, one handkerchief box	Napkin ring.
		Needlework, Quilts, and Afghans.	
Miss Nancy Jackson, 14 years old	Elk Grove	Best log cabin quilt	Napkin ring.
Mrs. A. Weston	Sacramento	Log cabin quilt	Napkin ring.
Miss Alice Powell	Sacramento	Worsted hexagon quilt	Hon. mention.
Mrs. M. E. Coolidge.	San Francisco	Best silk quilt	$5
Mrs. J. P. Odbert	Sacramento	Silk quilt	Special mention.
Mrs. Peter Davis	Sacramento	One quilt, pine apple pattern	Napkin ring.
Mrs. R. H. Byers	Sacramento	Best woven white quilt, one hundred years old	$5
Mrs. H. Cronkite	Sacramento	Worked quilt	Napkin ring.
Carrie Wilgus		Patchwork quilt	Napkin ring.
Mabel Alden	Placerville.	Dollbaby quilt	Hon. mention.
Mrs. N. J. Brown	Sacramento	Quilted quilt	Napkin sing.
Miss Jennie Bradley	Sacramento	Patchwork quilt	Napkin ring.
Mrs. F. W. Reinhart.	Sacramento	Best crochet quilt and pillow slips	$5
Miss Ella Lansing, 9 years old	Sacramento	Patchwork quilt	Napkin ring.
Mrs. Dr. Morgan	Sacramento	Two quilts	Special mention.
Mrs. R. H. Byers and others too high to be examined	Sacramento	Patchwork quilts	Hon. mention.
Mrs. W. H. Milliken.	Sacramento	Best child's afghan	$5
Miss Mary Huelsmann	Sacramento	One fancy baby suit	Hon. mention.
Mrs. H. Kuhl	Sacramento	Child's afghan	Hon. mention.
Miss Emma Hartwell, 10 years old	Sacramento	One child's apron, hand sewing	Napkin ring.
Mrs. H. Cronkite	Sacramento	Best hand sewing	$5
Miss Georgie Wilburn	Sacramento	One calico shirt	Napkin ring.
Miss Mattie George	Sacramento	One calico shirt	Napkin ring.

CLASS III—Continued.

Exhibitor.	Post Office.	Article.	Premium.
Michael Kraker	Sacramento	Best display of children's and ladies' clothing, California make	$25
Mrs. Otis		Five quilts	$5 and Nap. ring.
Mrs. Kate Haas		Two knit quilts, two pillow cases	Napkin ring.
		Clothing, Hats, Caps, and Furs.	
D. H. Quinn	Sacramento	Best exhibition of men's and boys' hats and caps	Silver medal.
D. H. Quinn	Sacramento	Best collection of furs	$25
J. C. Meussdorffer	Sacramento	Best silk hat	$5
D. H. Quinn	Sacramento	Best soft hat	$5
G. L. Mason	Whitten & Co., Burlington, Vt.	Best display of leather gloves and mittens (Witten's patent)	Diploma.
S. Wilzinski	Sacramento	Best exhibit of men's clothing	$10
S. Wilzinski	Sacramento	Best exhibit of boys' clothing	$5

FOURTH DEPARTMENT.

CLASSES I AND II.

Exhibitor.	Post Office.	Article.	Premium.
Bryant & Taylor	San Francisco	Best display of burglar and fire-proof safes, Diebold & Kenzile, makers	Diploma.
Bryant & Taylor	San Francisco	Fire-proof trunk	Hon. mention.
Hall's Safe and Lock Company	San Francisco	Best burglar and fire-proof safe	$20
Hall's Safe and Lock Company	San Francisco	Best burglar-proof safe	Diploma.
Hall's Safe and Lock Company	San Francisco	Best display of safe locks	Diploma.
G. A. Raymond	San Francisco	McNeal & Urbin's fire-proof safe	Diploma.
H. Van Every	Sacramento	Best milk can	$5
H. Van Every	Sacramento	Best parlor stove	$5
H. Van Every	Sacramento	Best cooking stove	$5
H. Van Every	Sacramento	Best Norman range	Dip. spec. notice.
R. C. Terry & Co	Sacramento	Best cooking range	$10
R. C. Terry & Co	Sacramento	Best portable range (for wood)	$5
R. C. Terry & Co	Sacramento	Richmond's palace range (for coal)	Hon. mention.
R. C. Terry & Co	Sacramento	Best Richmond's hot air heater	$5

CLASSES I AND II—Continued.

Exhibitor.	Post Office.	Article.	Premium.
R. C. Terry & Co	Sacramento	Richmond's portable heater.	Hon. mention.
R. C. Terry & Co	Sacramento	Best Laundry Queen stove	$5
R. C. Terry & Co	Sacramento	Best gas parlor grate	Diploma.
R. C. Terry & Co	Sacramento	Best gas stove	$5
R. C. Terry & Co	Sacramento	Best ornamental statuary	$5
R. C. Terry & Co	Sacramento	Best one pair ornamental iron vases	$3
R. C. Terry & Co	Sacramento	Best assortment Japanned ware	Diploma.
R. C. Terry & Co	Sacramento	Best display of kitchen utensils	$5
R. C. Terry & Co	Sacramento	Gas chandeliers and burners.	Diploma.
R. C. Terry & Co	Sacramento	Gas chandeliers and reflectors	Hon. mention.
R. C. Terry & Co	Sacramento	Street lantern	Hon. mention.
R. C. Terry & Co	Sacramento	Best display of silverware	$25
David Bush	Sacramento	Best display of chandeliers and burners	$10 and diploma.
David Bush	Sacramento	One glass globe	Hon. mention.
John J. Cass	Sacramento	Best display of table cutlery.	Silver medal and diploma.
John J. Cass	Sacramento	Best pocket cutlery	$5
John J. Cass	Sacramento	Best pruning shears	$5
John J. Cass	Sacramento	Best hunter's knife	$5
Huntington & Hopkins	Sacramento	Best display of axes	$5
Huntington & Hopkins	Sacramento	Best display of door trimmings	$5
Huntington & Hopkins	Sacramento	Best display of window trimmings	$5
Huntington & Hopkins	Sacramento	Best display of shutter trimmings	$5
Huntington & Hopkins	Sacramento	Best display of general hardware	$10
Huntington & Hopkins	Sacramento	Best display of iron and steel	$5
Huntington & Hopkins	Sacramento	Best display of mechanics' tools	$10
Huntington & Hopkins	Sacramento	Best display of locks	Hon. mention.
Huntington & Hopkins	Sacramento	Best circular saw	$5
Huntington & Hopkins	Sacramento	Best mill saw	$5
Huntington & Hopkins	Sacramento	Best hand saw	$5
Huntington & Hopkins	Sacramento	Best files	$5
Huntington & Hopkins	Sacramento	Best pruning knives	$5
Huntington & Hopkins	Sacramento	Best anti-friction metal	$5
Huntington & Hopkins	Sacramento	Best shot	$5
F. B. Stevens	Sacramento	Display pruning knives	Diploma.

CLASSES I AND II—Continued.

Exhibitor.	Post Office.	Article.	Premium.
I. L. Merrell	San Francisco	Best display of lamps (California invention)	$10 and diploma.
Adams, Wadsworth & Co.	Sacramento	Best display brass works	$20 and diploma.
Adams, Wadsworth & Co.	Sacramento	Best display of locks (California manufacture)	$5

CLASS III.

Exhibitor.	Post Office.	Article.	Premium.
A. T. Sherwood & Co.	Sacramento	Hospital bed or couch [The committee call particular attention to this article, for comfort of invalids.]	Diploma.
A. T. Sherwood & Co.	Sacramento	Extension cot	Hon. mention.
A. T. Sherwood & Co.	Sacramento	Elastic bed	Diploma.
E. C. Smith	Sacramento	Clothes, book, towel, flower, and toilet racks	Hon. mention.
S. McMullen	Lodi	Inlaid center table	Diploma.
J. Campbell	Sacramento	Spring bed	Hon. mention.
C. V. Reeder	San José	Spring bed	$5
Cooley & Green	Sacramento	Crandall spring bed	Hon. mention.
A. McEwen	Sacramento	School desk	Hon. mention.
W. L. Manor	Cacheville	Bed spring	Hon. mention.
Goodwin & Co.	San Francisco	Parlor chairs	$10
John Breuner	Sacramento	Dressing bureau	$10
John Breuner	Sacramento	Sofa	$10
John Breuner	Sacramento	Lounge	$5
John Breuner	Sacramento	Extension table	$5
John Breuner	Sacramento	Parlor furniture	$20
John Breuner	Sacramento	Office chair	$5
John Breuner	Sacramento	Display of furniture	$20
John Breuner	Sacramento	Bookcase	$5
John Breuner	Sacramento	Wardrobe	$10
John Breuner	Sacramento	Bedroom furniture	$10
John Breuner	Sacramento	Office desk	$5
John Breuner	Sacramento	Writing desk	$5
Dale & Co.	Sacramento	Sick chair	Diploma.

CLASS IV.

Exhibitor.	Post Office.	Article.	Premium.
Nichols & Co.	Sacramento	Display of cedar ware	$5
Nichols & Co.	Sacramento	Display of pine ware	$5
Nichols & Co.	Sacramento	Display of oak ware	$5
Nichols & Co.	Sacramento	Display of willow ware	$10
Nichols & Co.	Sacramento	Display of splitwood basket ware	$3
Nichols & Co.	Sacramento	Display of osier willow	$5
Nichols & Co.	Sacramento	Display of wooden ware	$25
Nichols & Co.	Sacramento	Exhibition of broomcorn, brooms and brushes	$5
Nichols & Co.	Sacramento	Assortment cooper's wares	$15
San Francisco Brush Factory	San Francisco	Assortment hair brushes	$5
		Musical instruments.	
Sherman & Hyde	San Francisco	Best grand piano (Webber)	$20
Chas. S. Eaton & Co.	San Francisco	Best square piano (Hazelton Bros)	$20
Chas. S. Eaton & Co.	San Francisco	Best parlor piano (Hazelton Bros)	$10
Chas. S. Eaton & Co.	San Francisco	Estey reed organ	Hon. mention.
Wm. G. Badger	San Francisco	Geo. H. Wood's reed organ	Hon. mention.
Seward & Aiken	San Francisco	Patent musical instructor and sounding staff	Diploma.
Wm. G. Badger	San Francisco	First contra bass (by Geo. Southworth)	Hon. mention.

CLASSES V AND VI.

Exhibitor.	Post Office.	Article.	Premium.
Dale & Co.	Sacramento	Best breech-loading shotgun	$5
Huntington, Hopkins & Co.	Sacramento	Best stove polish	$5
California Chemical Paint Company	San Francisco	Best lot Averill's chemical paint	Silver medal.

CLASS VII.

Exhibitor.	Post Office.	Article.	Premium.
Manhattan Marble Company	San Francisco	Collection of manufactured marble	Silver medal.
Aitken & Luce	Sacramento	Display of California marble	$20
N. Clark & Co	Sacramento	Stone-ware	Diploma.
N. Clark & Co	Sacramento	Display of stone-ware	$10
N. Clark & Co	Sacramento	Earthenware *	Special premium.
N. Clark & Co	Sacramento	Terracotta	Diploma.
N. Clark & Co	Sacramento	Drain tile	$5
N. Clark & Co	Sacramento	Sewer pipe *	Special premium.
N. Clark & Co	Sacramento	Stone linings *	*Silver medal for the three.
N. Clark & Co	Sacramento	Fire brick	$3
San Francisco Glass Works	San Francisco	Display glassware	$10
San Francisco Glass Works	San Francisco	Bottles, green glass	Diploma.

CLASS VIII.

Exhibitor.	Post Office.	Article.	Premium.
C. T. Wheeler	Sacramento	Specimen cinnabar	Hon. mention.

FIFTH DEPARTMENT.

CLASS II.

Exhibitor.	Post Office.	Article.	Premium.
Marion Biggs	Biggs' Station	White Australian wheat (two bushels.)	$10
Marion Biggs	Biggs' Station,	Chevalier barley (sample.)	$5
Marion Biggs	Biggs' Station	Nepul barley (sample.)	$5
R. J. Merkley	Sacramento	Bale of hops	$5
W. Van Wert	Nord	Pride of Butte wheat (two bushels.)	$10
J. L. Keefer	Nord	Sack flour	Silver medal.
T. L. Chamberlain	Lincoln	Tappahannock wheat (two bushels.)	$10
Jno. Smith	Sacramento	Sugar beet seed	Diploma.
T. H. Fisher	Sacramento	White corn (one bushel.)	$5
T. H. Fisher	Sacramento	Yellow corn (one bushel.)	$5
Jno. Smith	Sacramento	One peck tomatoes	$3
T. H. Fisher	Sacramento	Six Yankee pumpkins	$5

CLASS II—Continued.

Exhibitor.	Post Office.	Article.	Premium.
T. K. Stewart	Sacramento	Six red turnip beets	$3
T. K. Stewart.	Sacramento	Half peck pole beans	$2
T. K. Stewart	Sacramento	Six stalks popcorn	Hon. mention.
Robert Cowne	Sacramento	One bushel yellow corn	Special mention.
Jacob Lyon	Placerville	Peerless potatoes (white.)	$5
F. Gabrielle & Co	Sacramento	Twelve parsnips	$3
F. Gabrielle & Co	Sacramento	Six drumhead cabbages	$3
F. Gabrielle & Co	Sacramento	Six red Dutch cabbages	$3
F. Gabrielle & Co	Sacramento	Six other varieties cabbage	$3
F. Gabrielle & Co	Sacramento	Three heads cauliflower	$3
F. Gabrielle & Co	Sacramento	Three heads broccoli	$3
F. Gabrielle & Co	Sacramento	Six heads lettuce	$2
F. Gabrielle & Co	Sacramento	Red onions	$3
F. Gabrielle & Co	Sacramento	Yellow onions	$3
F. Gabrielle & Co	Sacramento	White onions	$3
F. Gabrielle & Co	Sacramento	Twelve roots salsify	$3
F. Gabrielle & Co	Sacramento	Six stalks celery	$3
F. Gabrielle & Co	Sacramento	Six cucumbers	$2
F. Gabrielle & Co	Sacramento	Half peck Lima beans	$3
F. Gabrielle & Co	Sacramento	Second best table of vegetables	$20
J. H. Aiken	Sacramento	Greatest variety of peas	$5
J. H. Aiken	Sacramento	One peck castor oil beans	$5
J. H. Aiken	Sacramento	One peck field peas	$2
J. H. Aiken	Sacramento	One peck garden peas	$3
Jno. H. Wolf	Brighton	Six Valparaiso squashes	Special mention.
Jno. H. Wolf	Brighton	Six marrofat squashes	$3
Jno. H. Wolf	Brighton	Six French netted muskmelons	$3
Jno. H. Wolf	Brighton	One case quinces	Hon. mention.
R. Williamson	Sacramento	Six Hubbard squashes	$3
R. Williamson	Sacramento	Six crookneck squashes	$3
R. Williamson	Sacramento	Twelve carrots	$3
Joseph Putnam	Lockford	One bale hops	Silver medal.
D. Lewis	Los Angeles	One bale Bagdale hops	Hon. mention.

CLASS III.

Exhibitor.	Post Office.	Article.	Premium.
J. H. Parr	Brighton	Mountain sweet watermelons	$2
J. H. Parr	Brighton	Mammoth sweet corn	$3
J. H. Parr	Brighton	Custard squash	Hon. mention.
Jno. Studarus	Brighton.	Ice cream watermelons	$3
N. H. Dixon	Cosumnes	One half dozen ears corn	Hon. mention.
P. Burns	Sacramento	Greatest variety Irish potatoes	$10
Mark Hopkins	Sacramento	Three stalks Central American sugar cane	Hon. mention.
De Bernardi	Sacramento	Table of vegetables	$30
S. Cole	Gilroy	Peachblow potatoes (best any other variety)	$5
J. H. Carrington	Florin	Sweet mountain peppers (for pickles)	$3
C. W. Hoit	Sacramento	White Cylesian sugar beets.	$3
C. W. Hoit	Sacramento	Green fleshed muskmelons	$3

CLASS IV.—FLOWERS.

Exhibitor.	Post Office.	Article.	Premium.
Miller & Sievers	San Francisco	Best collection of flowering plants in bloom	$25
E. E. Moore	San Francisco	Best collection of ornamental foliage plants	$25
Miller & Sievers	San Francisco	Best collection of new and rare plants	$15
Miller & Sievers	San Francisco	Best collection of roses in bloom	$15
Miller & Sievers	San Francisco	Best collection of fuschias in bloom	$15
Miller & Sievers	San Francisco	Best collection of cut flowers.	$10
Miller & Sievers	San Francisco	Best display of bouquets	$10
E. E. Moore	San Francisco	Best collection of Australian plants	$10
Mark Hopkins	Sacramento	Best collection of plants suitable for green house, conservatory, and window culture	$15
E. E. Moore	San Francisco	Best display of hanging baskets containing plants.	$10
A. Ebel	Sacramento	For collection of Australian plants	Hon. mention.
Jos. Hutchinson	Oakland	Display of dahlias and pinks	Silver medal.
Mrs. B. B. Cutter	Sacramento	For basket tube roses	Napkin ring.
Mrs. J. H. Carroll	Sacramento	For one very large bouquet.	Napkin ring.

CLASS V.

Exhibitor.	Post Office.	Article.	Premium.
S. Cole	Gilroy	Best cheese under one year old	$10
S. Cole	Gilroy	Best and largest display of cheese	$20 and diploma.
Mrs. S. M. Burns	Sacramento	Domestic corn bread	$5
Mrs. S. M. Burns	Sacramento	Domestic rye bread	$5
Miss C. E. Burns	Sacramento	Domestic wheat bread	Napkin ring.
Mrs. M. Wilson	Sacramento	Two varieties wheat biscuit.	$2
Mrs. A. C. Cowne	Sacramento	Twenty-five pounds butter, six months old	$15
Mrs. G. Gerrish	Sacramento	Domestic wheat bread and soda biscuit	Napkin ring.
Miss E. Hartwell (ten years of age)	Sacramento	Domestic brown bread	$5
Miss A. Odbert (nine years of age)	Sacramento	Domestic wheat bread	$5
Mrs. H. Cronkite	Sacramento	Butter in rolls	$10
San Francisco Beet Sugar Co	San Francisco	Four varieties sugar in boxes	Hon. mention.
Sacramento Beet Sugar Co	Sacramento	One hundred pounds and over beet sugar	$20

CLASS VII.

Exhibitor.	Post Office.	Article.	Premium.
Mrs. H. Cronkite	Sacramento	Largest and best variety of jellies (in glass)	$20
Mrs. J. P. Odbert	Sacramento	Largest and best variety of fruit (in glass)	$20
Mrs. J. P. Odbert	Sacramento	Largest and best variety of preserves (in glass)	$10
Mrs. J. P. Odbert	Sacramento	Largest and best variety of pickles, including fruits	$15
Mrs. James Lansing	Sacramento	Largest and best variety of brandied fruits	$5
Mrs. H. Cronkite	Sacramento	Largest and best variety of dried fruits	Hon. mention.
Miss M. Barret (nine years of age)	Sacramento	Twelve varieties preserved fruits and jellies	Napkin ring.
W. R. Strong	Sacramento	Best display of Harbison's honey	$5
James T. Day	Sacramento	Best display of seedling peaches (in brandy)	Hon. mention.

SIXTH DEPARTMENT.

CLASS I—GREEN FRUITS.

Exhibitor.	Post Office.	Article.	Premium.
D. C. Young	Sonoma	Best display of apples	$30
Ira S. Bamber	Placerville	Best twelve varieties of apples	$15
Robert Williamson	Sacramento	Best six varieties of apples	$10
Dr. W. S. Manlove	Sacramento	Best three varieties of apples.	$5
D. C. Young	Sonoma	Best display of pears	$30
D. C. Young	Sonoma	Best twelve varieties of pears	$15
T. K. Stewart	Sacramento	Best six varieties of pears	$10
D. C. Young	Sonoma	Best three varieties of pears.	$5
Ira S. Bamber	Placerville	Best display of peaches	$15
Ira S. Bamber	Placerville	Best six varieties of peaches.	$10
Ira S. Bamber	Placerville	Best one variety of peaches.	$5
Ira S. Bamber	Placerville	Best display of plums	$15
Ira S. Bamber	Placerville	Best five varieties of plums.	$10
D. C. Young	Sonoma	Best one variety of plums	$5
Ira S. Bamber	Placerville	Best green figs	$5
D. C. Young	Sonoma	Best display of tropical fruits	$20
D. C. Young	Sonoma	Greatest number and best specimen of oranges	$5
D. C. Young	Sonoma	Greatest number and best specimen of lemons	$5
Robert Williamson	Sacramento	Best display of seedling fruits	$10
D. C. Young	Sonoma	Best general display of fruit, embracing the best and greatest varieties	$50

CLASS II—DRIED AND PRESERVED FRUITS, NUTS, ETC.

Exhibitor.	Post Office.	Article.	Premium.
Mrs. E. F. Aiken	Sacramento	Best twenty-five pounds of dried peaches	$
Mrs. E. F. Aiken	Sacramento	Best twenty-five pounds of dried plums	$
Mrs. E. F. Aiken	Sacramento	Best twenty-five pounds of dried apricots	$
C. W. Reed	Washington, Yolo	Best twenty-five pounds of dried pears	$
C. W. Reed	Washington, Yolo	Best twenty-five pounds of dried nectarines	$
Mrs. E. F. Aiken	Sacramento	Best twenty-five pounds of dried apples	$
Mrs. E. F. Aiken	Sacramento	German prunes	Hon. mention
J. Archer (for South Haven Pomological Society, South Haven, Michigan)	Sacramento	Case dried fruits (thirty-one varieties)	Diploma
Mrs. H. Cronkite	Sacramento	Best exhibit dried berries in varieties	$10
Ira S. Bamber	Placerville	Best ten pounds dried figs	$10
Robert Cowne	Sacramento	Best half peck soft shell almonds	$5
D. C. Young	Solano	Best half peck Italian chestnuts	Hon. mention
D. C. Young	Solano	Best half peck English walnuts	$5
B. D. T. Clough	Centerville, Alameda	Soft shell almonds	Hon. mention
D. Titcomb		Moffatt's fruit dryer	Diploma
Barnes & Barber	Sacramento	Package for shipping small fruits	$5
Barnes & Barber	Sacramento	Package for shipping grapes.	$5
Barnes & Barber	Sacramento	Pk'ge for shipping peaches.	$5
Barnes & Barber	Sacramento	Package for shipping plums.	$5
Barnes & Barber	Sacramento	Package for shipping pears.	$5

SEVENTH DEPARTMENT.

FINE ARTS.

Exhibitor.	Post Office.	Article.	Premium.
William Hahn	San Francisco	Best specimen of portrait painting in oil	$20
Norton Bush	San Francisco	Best exhibit landscape painting in oil	$40
Norton Bush	San Francisco	Best specimen landscape in oil	$20
William Hahn	San Francisco	Best exhibit animal painting	$40
Norton Bush	San Francisco	Best specimen fruit painting in oil	$10
Norton Bush	San Francisco	Best exhibit of paintings in oil	$50
Mrs. H. Van Heusen.	Sacramento	Best exhibit of photographs in water colors and Indian ink	$10
F. J. Lewis	Sacramento	For three paintings from nature, in oil, and pen drawing (bunch of grapes). (These being very good, and possessing great merit)	$10 and diploma.
Lelia Curtis & Co	San Francisco	Best exhibit of wood engravings	$10
E. C. Atkinson	Sacramento	Best exhibit of penmanship	$5
Mrs. H. Van Heusen.	Sacramento	Best exhibit crayon drawing	$5
Stella Sheppard (pupil of Espina)	San Francisco	Best exhibit pen drawings	Diploma.
P. A. Espina	San Francisco	Ornamental penmanship	Silver medal.
F. J. Lewis	Sacramento	Pen drawing	$10
Mrs. Hayden	Sacramento	Painting in oil and water colors	$10
Miss Katie Allmond	Sacramento	This young lady's pencil drawing, entitled "Catching Crawfish," is worthy of special mention	
Miss Katie Stephens	Woodland	The landscape painting in oil by this young lady, as the work of an amateur, is also worthy of special mention, possessing some very fine effects	
		Sculpture.	
J. C. Devine & Bro	Sacramento	Best exhibition of sculpture.	$20
Aitken & Luce	Sacramento	Best collection of marble works	$75
Aitken & Luce	Sacramento	Best exhibition of statuary and busts, in plaster	$20
		Designs and Models.	
Wm. Landerkin	Sacramento	Ingenious model of ship	$5
W. H. Manor	Cacheville	Model of portable fence	Hon. mention.
C. H. Stevens	Carson, Nevada	Window lock	Hon. mention.

MISCELLANEOUS DEPARTMENT.

Exhibitor.	Post Office.	Article.	Premium.
H. Epstein & Co.	San Francisco	Dr. Henley's IXL bitters	Diploma.
H. Epstein & Co.	San Francisco	Royal palm gin	Diploma.
Dr. Henley	San Francisco	Regulator	Diploma.
H. N. Miner	San Francisco	Wagon jack, California invention	Diploma.
H. N. Miner	San Francisco	Gate or door spring	Diploma.
Alexander Porter	Woodland	Sicklegrinder	Hon. mention.
L. Koster	Sacramento	Model schooner	Diploma recom.
California Powder Works	San Francisco	Blasting and sporting powder, and Hercules powder.	Silver med. or dip.
Barnes & Barber	Sacramento	Assorted boxes	Diploma.
Barnes & Barber	Sacramento	Hard wood butter box	Hon. mention.
Woods & Lindo	San Francisco	Universal glazing tool	Hon. mention.
James Kip	San Francisco	Cummings' nut lock	Diploma.
Hucks & Lambert	San Francisco	H. L. axle grease	Diploma.
H. Godan	Brooklyn	Squirrel poison	Hon. mention.
J. L. River	Haywards	Wagon jack, California invention	Hon. mention.
Sawyer & Whedon	San Francisco	Hyde patent water power, California invention	Silver medal.
Hall's Safe and Lock Company	San Francisco	Safe and vault locks	Hon. mention.
Baker & Hamilton	Sacramento	Campbell's non-explosive bellows	Diploma.
Huntington, Hopkins & Co	Sacramento	Miter box of iron	Hon. mention.
Huntington, Hopkins & Co	Sacramento	Differential pully blocks	Hon. mention.
Huntington, Hopkins & Co	Sacramento	Drill and ratchet machine	Hon. mention.
Huntington, Hopkins & Co	Sacramento	Screw jack	Hon. mention.
Huntington, Hopkins & Co	Sacramento	Display of sporting goods	Diploma.
Bryant & Taylor	San Francisco	Immovable cash box	Diploma.
Bryant & Taylor	San Francisco	Fireproof deed box	Diploma.
Bryant & Taylor	San Francisco	Combination locks	Hon. mention.
Bryant & Taylor	San Francisco	Gate fixture	Diploma.
Dale & Co.	Sacramento	Bird cages	Hon. mention.
Dale & Co.	Sacramento	Nursery chairs	Hon. mention.
W. W. Bolton	Jacksonville, Or.	Fire regulator	Diploma recom.
C. A. Smith	Dixon	Patent fingerbar	Diploma.
J. S. Woolsey	Gilroy	Water heater	Diploma.
J S. Woolsey	Gilroy	Cheese vat	$10 and diploma.
E. M. Wright	Marysville	Hydraulic nozzle	Hon. mention.
W. Wilkinson	Sacramento	Sample of wool	Hon. mention.
P. Milich	Virginia City	Lubricating cup	Diploma.
I. C. Woods	San Francisco	Section of wooden railway	Hon. mention.
Weisler & Co.	San Francisco	Fluting sadirons	Hon. mention.
C. V. Rueler	San José	Model for fence	Hon. mention.
B. Essex	Sacramento	Double action press and hoisting machine	Silver medal.
B. Essex	Sacramento	Vegetable cutter, coffee grinder, and knife sharpener, combined	Hon. mention.
M. S. Bowdish	San Francisco	Handkerchief and glove boxes (Heath's patent)	Hon. mention.
Dr. H. Jackson	Woodland	Cough and ague remedy	Diploma.
Miss Nettie Winters	Solano	Charm string of 1081 buttons	Napkin ring.

MISCELLANEOUS DEPARTMENT—Continued.

Exhibitor.	Post Office.	Article.	Premium.
J. H. Corliss	Reno, Nevada	Vessel for drawing and measuring liquids	Special premium.
James Gray	Camptonville	Dr. J. Ball & Co.'s eye cups, for near and long sightedness	Diploma.
California Silk Manufacturing Company	San Francisco	Eight cases sewing silk and machine twist	$25 and Silver med.
Henry Fisher	Sacramento	Largest and best collection of ornamental confectionery	Diploma.
Mrs. H. H. Hartley	Sacramento	One jar preserved American aloes	Hon. mention.
Brown & Peabody	San Francisco	Match safe, with candles	Special premium.
Brown & Peabody	San Francisco	Double-pointed tacks	Special premium.
Mrs. R. H. Byers	Sacramento	Old Bible, published in 1789.	Hon. mention.
John Eitel	Sacramento	Best confectionery	Diploma.
Mrs. J. K. Alexander	Sacramento	Pearl shell from Red Sea, pipe from Mount of Olives, and flowers from Garden of Gethsemane	Hon. mention.
A. P. Smith	Sacramento	One ladder	$5
Mrs. James Lansing	Sacramento	China tea set, 58 years old	Hon. mention.
G. A. Swasey	San Francisco	Eureka portable tables	Diploma.
J. Driscol	Sacramento	Graining in imitation of California woods	Diploma.
Mrs. S. J. Marston	Centerville	Grand excelsior American chart, for fitting ladies garments	Diploma.
Madame Brossé	San Francisco	Dress fitting model	Special mention.
Mrs. J. H. Carroll	Sacramento	Dried grasses	Special mention.
Miss Annie Archer	Sacramento	Excelsior self-fitting chart for cutting ladies' dresses	Special mention.
Mrs. R. Pacheco	San Quentin	Oil paintings	Silver medal.

SPEED PROGRAMME—1873.

SPEED PROGRAMME—1873.

MONDAY, SEPTEMBER 15TH, 1873.

No. 1—TROTTING RACE.

Purse—six hundred dollars; free for all horses that have never beaten two minutes and forty-five seconds; mile heats, three in five; first horse, four hundred dollars; second, one hundred and twenty-five dollars; third, seventy-five dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
s. g. Frank	A. M. Plummer	Sacramento.
g. m. Oakland Maid	J. Sessions.	Oakland.
b. m. Swamp Angel	D. Dennison, T. Kimbell,	Sacramento.
b. g. Jupiter	Timothy Sargent.	San Francisco.
g. m. American Maid	G. W. Moulthrop, J. W. Thompson,	Sacramento.
d. g. Oregon Jake	J. H. Breed	Sacramento.
b. m. Lady Ella Lewis	Oscar Lewis	San Francisco.
b. g. Dutchman	A. F. Smith	Oakland.

Result.

Frank	6	4	dis.
Oakland Maid	3	3	2
Swamp Angel	5	dis.	
Jupiter	2	2	3
American Maid	dis.		
Oregon Jake	dis.		
Lady Ella Lewis	1	1	1
Dutchman	4	5	4

Time—2:30; 2:29¾; 2:31¼.

Judges—R. S. Carey, Jas. Haworth, Thos. Bodley.
Timers—R. T. Lect, S. T. Brewster, G. W. Gilbert.

No. 2—TROTTING RACE.

Purse—one thousand dollars; free for all horses that have never beaten two minutes and twenty-nine seconds—Occident and Harvest Queen barred; mile heats, three in five; first horse, seven hundred dollars; second, two hundred dollars; third, one hundred dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
g. m. May Howard	D. Dennison, Geo. F. Jacobs,	Sacramento.
s. g. Westfield	Tom Farrell, Eugene McCarty,	San Francisco.
b. h. Sam Purdy	Tom McClellan	San Francisco.
g. g. Tyrant	H. McClellan	San Francisco.

Result.

May Howard	1	2	2	3
Westfield	3	3	3	2
Sam. Purdy	2	1	1	1
Tyrant	withdrawn.			

Time—2:24½; 2:23¾; 2:24¾; 2:23¼.

Judges—R. S. Carey, Jas. Haworth, Thos. Bodley.
Timers—R. T. Leet, S. T. Brewster, G. W. Gilbert.

No. 3—RUNNING RACE.

Purse—Eight hundred dollars; mile heats, free for all three-year-olds; first horse, five hundred dollars; second horse, two hundred dollars; third horse, one hundred dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
c. f. Little Agnes, by Norfolk, dam Pele, by Belmont	Capt. Johnson	San Diego.
b. f. Camilla Urso, by Lodi, dam Annette, by Lexington	Henry Walch	Alameda.
b. c. Hardwood, by Woodburn, dam Moss Rose, by Imported Knight St. George	John Hall	Alvarado.
b. f. Alphy, by Imported Hercules, dam Waxey	R. T. O'Hanlon	San José.
b. c. Ballot Box, by Norfolk, dam Ada C., by Bob Johnson	Theo. Winters	Davisville or Washoe City.

Result.

Little Agnes	3	5	dist.
Camilla Urso	dead heat.	4	4
Hardwood	5	3	2
Alphy	dead heat.	1	3
Ballot Box	4	2	1

Time—1:44¼; 1:46¾; 1:48¾.

Judges—R. S. Carey, Jas. Haworth, and Thos. Bodley.
Timers—E. C. Singletary, C. Green, and S. T. Brewster.

NOTE.—After the third heat, the Judges discovered Rule Fifty-eight, and under that Rule they awarded first money to Alphy; second money to Camilla Urso; third money they divided between the two. All pools sold after second heat were declared off.

No. 4—RUNNING RACE.

Purse—Twelve hundred dollars; free for all; two-mile heats; first horse, eight hundred dollars; second horse, two hundred and fifty dollars; third horse, one hundred and fifty dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
s. h. Twenty Cents	Westley George	Carson City.
g. h. Tom Atchison, by Norfolk, dam Mary G., by Ashland	Thos. Atchison	Marysville.
b. h. Monday, by Colton, dam Molly Jackson	J. M. Dickinson	San Francisco.
b. m. Irene Harding, by Jack Malone, dam Maccaria	S. J. Rose	Los Angeles.
c. h. Thad. Stevens, by Langford, dam Mary Chilton	Henry Walch	Alameda.
br. g. Target, by Rifleman, dam Jennie Hull	Willis Hull	Sacramento.
b. m. Bonita, by Norfolk, dam Margarita	Theo. Winters	Davisville or Carson City.

Result.

Twenty Cents	3	dis.		
Tom Atchison	5	drawn.		
Monday	withdrawn.			
Irene Harding	2	1	2	3
Thad. Stevens	4	2	1	1
Target	1	3	3	2
Bonita	withdrawn.			

Time—3:42¾; 3:37; 3:42; 3:45.

Judges—R. S. Carey, Jas. Haworth, and Thos. Bodley.
Timers—E. C. Singletary, C. Green, and S. T. Brewster.

No. 5—RUNNING RACE.

Purse—two hundred and fifty dollars; dash of one mile; free for all two-year-olds; entrance, fifty dollars, added; second horse to save his entrance.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
b. f. May Watson, by imported Hercules, dam Peri, by Boston	Charles Murphy	San José.
b. f. Zephyr, by Norfolk, dam by Lummax	John Stewart	Sacramento.
s. c. Firetail, by Norfolk, dam Fanny Howard	J. R. Buchanan	Stockton.
s. c. Bill Hazle, by Norfolk, dam by Owen Dale	Frank Dupoister	Sacramento.
c. c. ——, by Norfolk, dam Cleopatra	Henry Walch	Alameda.
br. c. ——, by Young Eclipse, dam Milly, by Slasher	James Mee	San Francisco.
blk. f. ——, by imported Eclipse, dam Hennie Farrow	James Mee	San Francisco.
b. c. Thornwood, by Woodburn, dam Viola, by imported Knight of St. George	R. T. O'Hanlon	San José.
b. f. Belle Morey, by Woodburn, dam by Ringgold	R. T. O'Hanlon	San José.
g. c. Waterford, by Langford, dam Margarita, by Lexington	Theodore Winters	Davisville or Carson City.

Result.

Blk. filly ——	1
Bill Hazle	2

Time—1:49.

Judges—R. S. Carey, James Haworth, Thomas Bodley.
Timers—E. C. Singletary, C. Green, S. T. Brewster.

No. 6—TROTTING RACE.

Purse—two thousand dollars; free for all; mile heats, three in five; first horse, fourteen hundred dollars; second horse, four hundred dollars; third horse, two hundred dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
b. g. George Treat	A. T. Smith	Oakland.
g. m. May Howard	Dan. Dennison George F. Jacobs	Sacramento. Sacramento.
s. g. Westfield	Tom Farrell E. McCarty	San Francisco. San Francisco.
b. h. Sam. Purdy	Tom McClellan	San Francisco.
b. g. Dexter	Barney Rice	San Francisco.
g. h. Tyrant	H. McClellan	San Francisco.

Result.

George Treat	dis.		
May Howard	2	2	2
Westfield	drawn.		
Sam. Purdy	1	1	1
Dexter	3	3	3
Tyrant	drawn.		

Time—2:23¾; 2:26½; 2:27.

Judges—R. S. Carey, James Haworth, Thomas Bodley.
Timers—S. T. Brewster, George Hammond, Capt. Weeks.

No. 7—TROTTING RACE.

A piece of plate, value two thousand dollars, for any horse beating the best time on record in this State.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
b. g. Occident	G. M. Martin (for Governor Stanford)	Sacramento.

Result.

Occident wins the plate.

Time—2:16¾.

Judges—R. S. Carey, James Haworth, and Thomas Bodley.
Timers—S. T. Brewster, George Hammond, Capt. Weeks, C. Green, E. H. Miller, Jr.

No. 8—PACING RACE.

Purse—one thousand dollars; free for all; mile heats; three in five; first horse, seven hundred dollars; second horse, two hundred dollars; third horse, one hundred dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
b. g. John Swindle	Peter Brandow	San Francisco.
b. g. Defiance	A. C. St. John	San José.
g. g. Dan Voorhees	Barney Rice	San Francisco.
s. g. Jim Brown	Timothy Sargent	San Francisco.

Result.

John Swindle	dist.		
Defiance	2	2	2
Dan. Voorhees	1	1	1
Jim Brown	3	3	3

Time—2:20; 2:20; 2:20¼.

Judges—R. S. Carey, Jas. Haworth, Thos. Bodley.
Timers—S. T. Brewster, Capt. Weeks, Geo. Hammond.

No. 9—RUNNING RACE.

Purse—one thousand dollars; mile heats; free for all; first horse, seven hundred dollars; second horse, two hundred dollars; third horse, one hundred dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
b. h. Thornhill, by Woodbine; dam, unknown	J. H. Shirley	Alameda.
br. m. Nell Flaherty, by Rifleman; dam Jennie Hull	J. M. Dickinson	San Francisco.
b. h. Oceola, by Norfolk; dam Black Maria	Tom Atchison	Marysville.
c. h. Thad. Stevens, by Langford; dam Mary Chilton	Henry Walch	Alameda.

Result.

Thornhill	1	1
Nell Flaherty	2	3
Oceola	3	2
Thad. Stevens	withdrawn.	

Time—1:44; 1:43.

Judges—Jas. Haworth, Capt. Weeks, Thos. Bodley.
Timers—S. T. Brewster, N. Coombs, Wm. Wall.

No. 10—RUNNING RACE.

Purse—five hundred dollars; dash of one mile and a half; free for all three-year-olds; first horse, three hundred and fifty dollars; second horse, one hundred dollars; third horse, fifty dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
s. f. Little Agnes, by Norfolk, dam Pele, by Belmont	Capt. Johnson	San Diego.
br. f. Camilla Urso, by Lodi, dam Annette, by Lexington	Henry Walch	Alameda.
b. f. Alphy, by imported Hercules, dam Waxey	R. T. O'Hanlon	San José.
b. c. Ballot-box, by Norfolk, dam Adda C., by Bob Johnson	Theo. Winters	Davisville or Carson City.

Result.

Little Agnes	2
Camilla Urso	withdrawn.
Alphy	1
Ballot-box	withdrawn.

Time—2:47¼.

Judges—Jas. Haworth, Capt. Weeks, Thos. Bodley.
Timers—S. T. Brewster, Wm. Watt, N. Coombs.

No. 11—PACING RACE.

Purse—Six hundred dollars, free for all second-class pacers that have never beaten two minutes and twenty-three seconds; mile heats; three in five; first horse, four hundred dollars; second horse, one hundred and twenty-five dollars; third horse, seventy-five dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
b. g. John Swindle	Peter Brandow	San Francisco.
b. m. Prussian Maid	D. Dennison. Gov. Stanford.	Sacramento.
e. g. Jim Brown	Timothy Sargent	San Francisco.
s. m. Capitola	S. Harris	Oakland.
b. m. Lady St. Clair	D. Brosner	San Franciscoo.
b. g. John	W. A. Findley	Wheatland.

Result.

Swindle	4	5	4	4
Jim Brown	3	1	1	1
Prussian Maid	1	3	2	2
Capitola	5	4	dis.	

Lady St. Clair	2	2	3	3
John	withdrawn.			

Time—2:19; 2:26; 2:21¼; 2:23¼.

Judges—Jas. Haworth, Capt. Weeks, Thos. Bodley.
Timers—Dr. Brewster, N. Coombs, Wm. Watt.

No. 12—Trotting Race.

Purse—two thousand dollars; two mile heats, free for all; first horse, one thousand four hundred dollars; second, four hundred dollars; third, two hundred dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
s. g. Jerome	D. Dennison, G. T. Jacobs,	Sacramento.
b. g. Dexter	Barney Rice	San Francisco.
b. g. Jupiter	Timothy Sargent	San Francisco.
d. g. Oregon Jake	J. H. Breed	Sacramento.
b. m. Mary Davis	E. M. Skaggs	Sacramento.

Result.

Jerome	1	1
Dexter	2	2
Jupiter	3	4
Oregon Jake	drawn.	
Mary Davis	4	3

Time—5:00¼; 5:01½.

Judges—James Haworth, Capt. Weeks, William Watt.
Timers—S. T. Brewster, John Lancaster, A. A. Sargent, N. Coombs, C. Green.

No. 13—Trotting Race.

Purse—seven hundred and fifty dollars, free for all horses that have never beaten two minutes and thirty-five seconds; mile heats, three in five; first horse, five hundred dollars; second, one hundred and fifty dollars; third, one hundred dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
b. g. Geo. Treat	A. F. Smith	Oakland.
s. g. Frank	A. M. Plummer	Sacramento.
b. g. Yuba Boy	D. Dennison, M. Knight,	Sacramento.
br. g. Brilliant	A. C. St. John	San José.
g. m. American Maid	G. W. Moulthrop, J. H. Thompson,	Sacramento.
b. m. Lady Ella Lewis	Oscar Lewis	San Francisco.
b. m. Lady Slasher	A. D. Mailliard	San Rafael.
s. g. Westfield	Thomas Farrell, E. McCarty,	San Francisco.

Result.

Geo. Treat	2	2	1	2	2	1	2
Frank	dist.						
Yuba Boy	dist.						
Brilliant	withdrawn.						
American Maid	withdrawn.						
Lady Ella Lewis	1	1	2	dist.			
Lady Slasher	withdrawn.						
Westfield	3	3	3	1	1	2	1

Time—2:31; 2:28; 2:28½; 2:30; 2:26½; 2:28½; 2:31.

Judges—James Haworth, Captain Weeks, William Watt.
Timers—Doctor Brewster, J. Lancaster, A. A. Sargent, N. Coombs, C. Green.

Note.—After fourth heat, the race was postponed until next day at ten o'clock.

No. 14—Running Race.

Purse—twelve hundred dollars; mile heats, three in five; free for all; first horse, eight hundred dollars; second, two hundred and fifty dollars; third, one hundred and fifty dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
b. m. Nell Flaherty, by Rifleman, dam Jennie Hull	J. M. Dickinson	San Francisco.
b. h. Tom Atchison, by Norfolk, dam Mary G., by Ashland	Thomas Atchison	Marysville.
b. m. Irene Harding, by Jack Malone, dam Maccaria	L. J. Rose	Los Angeles.
c. h. Thad. Stevens, by Langford, dam Mary Chelton	Henry Walch	Alameda.

Result.

Nell Flaherty	1	1	3	3	2
Tom Atchison	4	4	4	4	4
Irene Harding	2	2	2	2	3
Thad. Stevens	3	3	1	1	1

Time—1:46½; 1:45; 1:46; 1:48¾; 1:48¾.

Judges—James Haworth, Captain Weeks, Judge Hutton.
Timers—S. T. Brewster, N. Coombs, A. A. Sargent.

No. 15—RUNNING RACE.

Purse—eight hundred dollars. Two mile heats; free for all three-year-olds; first horse, five hundred dollars; second horse, two hundred dollars; third horse, one hundred dollars.

Entries.

Names and pedigree of horses.	By whom entered.	P. O. address.
s. f. Little Agnes, by Norfolk, dam Pele, by Belmont	Capt. Johnson	San Diego.
br. f. Camillo Urso, by Lodi, dam Annette, by Lexington	Henry Walch	Alameda.
b. c. Hardwood, by Woodburn, dam Moss Rose, by imp. Knight of St. George	John Hull	Alvarado.
b. c. Ballot-box, by Norfolk, dam Adda C., by Bob Johnson	Theo. Winters	Davisville or Carson City.

Result.

Little Agnes	2	2
Camillo Urso	dr.	
Hardwood	1	1
Ballot-box	dr.	

Time—4:03¼; 3:45⅓.

Judges—James Haworth, R. S. Carey, and M. D. Boruck.
Timers—R. T. Leet and William Dunlap.

NOTE.—After the first heat the race was postponed until next day at two o'clock P. M. on account of darkness.

ANNUAL ADDRESS.

ANNUAL ADDRESS.

DELIVERED BEFORE THE CALIFORNIA STATE AGRICULTURAL SOCIETY, AT THE PAVILION, IN SACRAMENTO, ON THURSDAY EVENING, SEPTEMBER EIGHTEENTH, EIGHTEEN HUNDRED AND SEVENTY-THREE.

By Hon. A. A. SARGENT.

Mr. President, Ladies and Gentlemen:

The object of your annual Fair, upon the great success of which I congratulate you, is primarily the promotion of farming interests. This you seek to accomplish by the exchange of practical ideas, by encouraging the development of new industries, and by the discovery of improved modes of performing old processes. You seek to advance the intrinsic value of articles produced, by rewards from a common fund for unexceptionable excellence, and you benefit yourselves and the State by raising the worth, while lessening the cost, of the vast range of agricultural productions. The motive here operative, is the principal cause of the progress which the civilized world has gained, since the middle ages, in the improvement of the arts of life and in human comfort. Hallam draws a picture of the farmer's house in England, in the time of Henry VIII, with its one room and one story. Without chimney, the fire was kindled in the center, the smoke finding its way out, as in an Indian wigwam, through a hole in the roof, or through the unglazed openings left at the sides for light and air. The domestic animals, of all kinds, were housed under the same roof. While this was the condition of the farmer, the noble and wealthy had none of the comforts that to day are indispensable to the poorest classes. Wainscoted or plastered rooms were unknown, as were carpets, window glass, or even beds and chairs, except as a rare luxury. The tools of the farmer, and of all mechanics, were few in number and of the rudest description. The labor-saving machinery, that now almost thinks, and that multiplies by many million fold the productive capacity of man, had not even a rudimentary existence. The energies of steam were unsuspected. The intelligence that lives in the lightning-flash had made no sign. From then to now, how vast the interval—not of time, merely, but of the condition of the producing classes. From the shrouded past peer forth ignorance and incapacity, famine, misery and squalor, unwholesome as the exhalations of a tomb. Need I compare with all this the condition of the farmer or the artisan of the present day, and especially in this favored land? Look around you for evidences of comfort and material prosperity, excelling the visions of prophetic days; for ingenious inventions, that would have sent their constructors to a wizard's stake in the olden time; for a beauty and perfection that no poet could have depicted for elysian fields.

What has wrought all these changes in behalf of mankind? It is the spirit of doubt and investigation; of encouragement to enterprise; of bounty to well doing. It is the ascendancy and association of practical, inventive men—an ascendancy gradually acquired as they fathomed the secrets of nature, and gained power by arming themselves from her arsenal. Each generation, now that the true path has been found, advances beyond the point reached by its predecessors, until the horizon of human skill and knowledge and achievement is unlimited. What can rationally be declared impossible in the light of the discoveries of the nineteenth century? The apparent and admitted laws of nature have been reversed by results attained by a truer insight into those laws. A statement of the facts now elementary would have been declared absurd ten years before the discovery of the electric telegraph. An able scientist discouraged the project to propel a vessel by steam across the Atlantic, upon philosophic principles that only experiment and success could answer. Forty years ago, it was admitted that in the rarified air of the summit of the Rocky Mountains, water would boil at so low a temperature that not enough steam could be made to propel a locomotive. The lesson we learn is, that there is an unlimited field for investigation, enterprise, and invention, and that practical men in every department of life are those who enrich the world with an accumulated wealth of ideas, tending to equalize the condition of mankind, diffuse the comforts of life, and build up material prosperity.

THE GAIN THE WORLD MAKES

In each generation by such agencies, is the higher average of the means of individual comfort, education, and independence. Favored by equal laws, that are the offspring of our civilization, the poor man of to-day may be the rich man of to-morrow, and, pressed by competition or misled into ruinous investments, the rich man of to-day may be poor to-morrow. No law conserves the colossal fortune; no law prevents its honest acquisition. The ancient antagonism between the producing and accumulating classes is measurably stilled, because, by the exchange of his surplus products, the producer becomes the accumulator. The world is becoming rich enough to spare from accumulated hoards the means to test new inventions, to create new industries, to provide broader bases both for production and for commerce, which affects exchanges. Thus, capital is not left to rest, or to be expended only in vicious pleasures, while those who have it not perish in want; but is turned to account for human improvement and happiness, by fostering those arts and enterprises which create, combine, and perpetuate the powers and agencies by which the wants of mankind are supplied. Dissolve all associations of capital, and nearly every spindle in the world would cease to revolve, every steamship cease to ply the ocean, and railroad to cross the land; the telegraph would no longer flash intelligence to the uttermost parts of the earth, and the general industries that enrich some, and feed and clothe all, would fall into disuse or be ineffectively pursued. The genius and necessities of the age forbid this; while they do not excuse the selfishness of individuals or associations, communities and rulers cannot afford it.

ACT WITH PASSION OR INJUSTICE.

The penalty is not written in the law, but it is surer than the fiat of Courts. King John gave the Jews the choice to part with their money or their teeth. The result was that capital fled the kingdom, and a money lender could not be found in the realm.

I have been led into this train of remark by the recent tenor of public thought. Summoned to speak to you, without the wish to do so on my part, I cannot better employ your time than by a discussion of every-day topics of interest to you, because they engross your thoughts, and of which I may be supposed to know more than of agricultural chemistry, the rotation of crops, or the economy of the farm yard. In this, I but follow the example of others who have made these topics the theme of able addresses delivered before all the recent State Agricultural Societies of the West. As a legislator it has been my duty to examine some phases of these subjects carefully, with a sense of responsibility, and I think it is possible to discuss, in the good temper befitting this audience, themes which have been made the occasion of violent tirade and unreason. In the discussion of such questions, whether by the press or by public addresses, something very different is needed as a means than to excite enmity and unchain evil passions; and the end to be attained is far more important than to promote the fortunes of a politician, or advance the objects of a faction.

THE MOST INTERESTING QUESTION

To the farmers of the West at the present time is, can the cost of transportation to distant markets of their coarse products be so reduced that these can be profitably raised? For such States as Iowa, Wisconsin, Minnesota, Illinois, and Indiana, remote from the seaboard, and having totally inadequate home markets for their staples, it is urged that the relation between the producer and the agencies of transportation should be readjusted. The true policy would seem to be to fairly divide between each, according to the capital and labor invested, the profits derived from sales to the consumer, when such profits exist. But where the conditions are such that profit to the producer is impossible, even if transportation is afforded below cost, where is the remedy? Iowa will produce a million tons surplus of hay, and hay is high in England. Yet so small is the value of hay in proportion to its bulk, that its transportation to England would be impossible. Corn and wheat can be transported further than hay; but there is a limit to each of these articles. The real problem is, can both producer and transporter thrive if they equitably share the profits resulting from their necessary connection in business? If it takes all the profits of the agriculturist to get his crop to market, or the railroad is compelled, by law or otherwise, to move the crops of a State at a loss, there is something wrong either in the adjustment of interests or in the nature of the business done. If coarse crops cannot be moved to a market where they will pay the farmer a profit except at a loss to the transporter that his general business cannot repay, the difficulty is not remedied by

VIOLENCE OR REVOLUTION.

Other crops must be raised, other industries substituted, or other modes of transportation invented. A paper in Illinois mildly proposes as a remedy that the French guillotine be set up on the plains of Illinois, and the heads of railroad owners roll in the basket. It further suggests that trains be not allowed to run through the counties, that the tracks be torn up, bridges burnt, and railroad hands killed. Here is anarchy; here is license, vulgar in its coarseness; but it is little less abhorrent when its suggestions are elaborately polished and delicately veiled.

In California, while there is much interest in the question, it is less absorbing, because we have access to the sea without such long lines of transportation. But it must be of importance while our farmers move their grain by rail, and it should be carefully weighed in an economic rather than in a partisan aspect. As

A QUESTION OF POLITICAL ECONOMY

Solely, I propose to discuss it, undeterred by the fear of misrepresentation, and in the discharge of a duty to the State, which should impartially foster all interests of capital or labor, whether individual or associated, which are recognized by its policy, and by that of civilization generally, as legitimate enterprises.

Distance is an important element in controlling the cost of transportation. Were the Humboldt Valley a great wheat field, the grain raiser there would necessarily pay more to transport his products to the sea than one in Napa or San José Valley. At the cheapest possible rate that transportation could be furnished by competing lines of railway, enforced by laws that cut down even below cost the price of conveyance, especially if those laws also operated in favor of his rival producers, the wheat cultivator in the Humboldt Valley might find the competition ruinous between him and his more fortunately located rival. He could perhaps only hope for a market abroad when there was a failure of crops in this State, and not then always in competition with the valleys of the Danube and the plains of Southern Russia. These countries produce the cereals in perfection, and in wonderful abundance, so that the ports of the Black Sea have long been held as the unfailing granaries of Europe. Great Britain is the only commercial nation of the world that needs to look abroad for bread for its people. France, Germany, and the United States, with about the same population, grow their own breadstuffs, and generally have each a surplus. It is this world-wide and crushing competition which renders wheat growing, even under favorable circumstances, a precarious and unprofitable business. Under that competition, the remoteness of wheat lands from the sea is a serious obstacle, perhaps an absolute bar, to success. Discontent does not remove it, for it cannot annihilate comparative distance. Railroad companies cannot overcome it, for they cannot create remunerative

markets. No legislation can devise a remedy for this phase of the evil. In this view, is not California

GROWING TOO MUCH WHEAT

To the exclusion of more profitable and diversified industries? To enhance our population, to save the productiveness of our lands, to insure a certain return for our capital and labor, must we not turn to new sources of wealth? Under such pressure the State of New York left off in a great degree the growing of wheat and substituted largely the production of butter and cheese. So did Ohio. Illinois and Indiana have taken to stock raising, as has Michigan, and to wool production. The products of the dairy, the exportation of beef and pork and wool, are found more remunerative than wheat growing. In so much there is a concentration of bulk into a smaller compass and more proportionate value. Coarse, bulky products require larger space and have a weight disproportionate to their value, and hence are costly to transport. But by these improved industries they are condensed in bulk and increased in value. Corn or wheat changed into hogs or cattle is found far more profitable than in its original shape, and can be transported at rates more likely to leave a profit for all concerned. But the

CHANGE IN OUR INDUSTRIES

Should not stop here. The agriculture of New England is progressing rapidly, because its other industries are great and varied. The two important sources of productive wealth, manufactures and agriculture, go there hand in hand with varied labor and reciprocal benefit. The farmer finds a home market for his products, the manufacturer furnishes cheaply articles of necessity or luxury to the farmer, and gives employment to the stalwart children of the latter which are not needed on the homestead. The transportation question has less meaning to the farmer, under such circumstances, for the exchange is at his very door. It is rather a question for the manufacturer who seeks a market for his productions in other States. On the contrary, in California, where the principal gain of the agriculturist is dependent on the price he can get for his surplus wheat; where, for lack of diversified industry, the home market is very limited; where, for much that is raised, there is not and cannot be created an adequate demand, it is worth while seriously to consider if the evil does not lie deeper than is sometimes assumed. If the very lowest cost of transportation is too onerous a tax for wheat production, in view of competition, one remedy is to avoid the transportation by

CREATING MANUFACTURING CENTERS

In our own State. Says Carey, "It is not until manufactures have been developed, and a market has thus been made in the neighborhood of the farm, that any real agriculture makes its appearance." Bowen declares that "If agriculture alone is pursued, all the mechanical skill of the people is wasted—all their fitness for commerce, all their enterprise is wasted." And says Hyatt, "Any farming community having in their midst a strong manufacturing center, will always be found with a good and sufficient home market for all that may be produced. Manufactures build up strong commercial and provision-consuming centers, which are, in fact, the only support to agriculture." Such a center the wheat growers of the world seek at a distance in the Liverpool market.

The employment of capital to reach these ends is not ordinarily within the reach of farmers; but I speak not only to farmers, but to the people of the State. Fortunate would we be if those having capital would "associate" to build up these new industries. But farmers cannot afford to exhaust their soil for the sake of a small and brief profit. Our State is well fitted to produce wines, silk, fresh and dried fruits, nuts, olive oil, and other articles of the semi-tropical class, which command a higher price per pound than wheat, with a greater yield and little more expense per acre. Our soil and climate give us a monopoly of these productions on the North American continent. We must learn to avail ourselves of this natural advantage. During this year we are importing largely, live hogs, ham, and bacon. We still import quantities of butter and cheese, with vast dairy capacities; canned corn and peas, and a long list of similar articles. Many of our wheat farmers do not raise their own potatoes or fruit. They are strangers, except by purchase, to milk and butter, eggs and meat. Can there be a better occasion to rebuke such improvidence? There are unquestionably pleasant homes on many of our farms and ranches; but many of them seem mere camping places, mere temporary shelters. The traditional homestead is not often enough realized, embellished with flowers and fruit trees, where at

> "—— parting day
> The herd wind slowly o'er the lea;"

But all is rude, untasteful, and temporary. So far as this is incident to a new country, it may be excused. But California is now in its majority, and it is full time for an improvement that brings not merely grace, beauty, and comfort, but also profit. The more the farmer does to supply his own wants, the less outlay of money to purchase necessaries, and the less need for payment for expensive transportation.

CALIFORNIA COTTON.

One article of agricultural production shows what the State is doing; what it can and should do. During this year three hundred thousand pounds of cotton have been raised in California. The article is nearly as good as Sea Island cotton, is very strong, and is just what is needed to mix with wool for the fabrics produced at our woolen mills. One mill alone uses four hundred thousand pounds, and all the mills together use three times as much as is raised in this State. These are suggestive facts in the line of action which I have indicated.

It has been urged as a reason why manufactures cannot flourish in this State, that we have but half a million of people, while such industries in the East have a market of nearly forty millions. In answer, it may be said that our woolen manufacturers compete successfully with those of other States in the East, and that forty per cent of their goods finds a market beyond this State.

If a fair proportion of the fifty millions of dollars in the savings banks of the State could be invested in the industries that build up other communities, the State would be vastly the gainer. Perhaps it is too much to expect while such banks pay twelve per cent dividends from loans on real estate. But it is to be anticipated that such a system will entail embarrassment while it continues, and we import one half of the necessaries we consume.

I have stated the general proposition that the relation between the producers and the

AGENCIES OF TRANSPORTATION

Should be so adjusted as to equitably divide between each the profits derived from sales to consumers of the products; but have tried to show that when, either by distance from market, or by too great competition, the product brings no profit on sales, the rule would leave the transporter without compensation. If the wheat grower in Alameda county, handy to the ship, can by sending his grain to Liverpool barely make both ends meet, one four hundred miles more remote can only send his to that market at a loss, unless he gets his transportation for nothing, which is absurd. In such case, one man's capital is used for another man's business without compensation, or the general business interests of the community are burdened that one may unduly thrive. The fact is, transportation should be furnished as low as running expenses, wear and tear, repairs and maintenance, necessary outlay for interest, and moderate return for capital will allow, and be rated according to distance, in which grades and curves are a dominant element, the frequency of loading and discharging, the character of the cargo, and the amount of traffic. These elements constitute the true rule, and must all be considered in making up a freight tariff. It is inequitable to add another, viz: that wheat or other coarse products must be transported at such rates as to make the raising of wheat, or such other products, profitable, no matter what the distance, or what the price of the article in the market. Yet, substantially, this latter idea has been diligently fostered, and railroad companies held up as enemies to the farmer because they do not conform to it. I am not here to assert that rates of transportation in this State do not exceed those which would result from the rule I have stated. Others, who have made the matter a study, can speak as to that. In a table, published by the *Overland* for this month, I find that the rate of freight between San Francisco and Colfax, per one hundred pounds for first class freight, is fifty-three cents; for second class, fifty cents; for third class, forty cents. On the Illinois Central Railroad, under their new railroad law, to which I shall presently refer, the rates for the same classes of freight, for the same distance, are respectively sixty-three cents, fifty-three cents, and forty-three cents. For the mountain division of the Central Pacific Railroad, between Rocklin and the Summit, an increase of grade of each twenty feet per mile is equal to an additional mile on a level. An equalization of grades over the Livermore Pass would greatly increase the distance. The Illinois road runs through a prairie country, and its business is enormously greater than that of any road in this State.

LEGISLATIVE REGULATION OF RAILROADS.

But the Reformed Railroad Law of Illinois may be too liberal. If freights and fares are too high, how shall they be regulated? One plan is for the Legislature to take the matter in hand and remedy all evils. A wise committee of experienced men, acting from reason and not prejudice, and influenced by justice rather than spite, might be able to submit a plan to the Legislature that would do justice to all parties.

Such a committee would have to consider that a ton of silk, worth fifty thousand dollars, could afford to pay a higher price for transportation than a ton of hay worth fifteen dollars. Mirrors and carboys of acid could not travel at the same rate as sheet iron and molasses. If valuable and condensed products do not pay well for transportation, coarse and bulky products can have no discrimination in their favor, and the new burden is laid on those who now most complain. It must be admitted that from some source an income must be derived sufficient to bear the necessary expenses. If a low uniform rate is laid on all articles, it must be higher than the present lowest rates, and in practice the low rates will be brought up. One difficulty in legislative regulation is want of experience of the average legislator in the complex matters of a railroad freight tariff. Governor Carpenter, of Iowa, in an address before the Agricultural Society of that State, wherein he dwelt with great force upon the need for a modification of the rates of transportation, said:

> "I am not prepared to say that a Legislature can successfully and wisely fix a schedule of tariff charges upon commodities exchanged and distributed by means of railway transportation; and, in fact, am inclined to the opinion that it is impracticable, as it seems to me that no ordinary enactment would either be sufficiently flexible to meet the changing processes of commerce, or the increasing wants of the country."

He holds the opinion that it would be difficult, in the general traffic of the country, to so hedge the railroads by statutes as not to allow them some discretion as to charges. But he holds that there is a limit on all articles above which they ought not to be permitted to advance their rates. There is, probably, the safe extent to which legislation on this point can go, if that limit can be ascertained—as it can be, if inquired for in a spirit of candor.

Charles Francis Adams, Jr., has given much thought to this matter, and has written ably and voluminously upon it in the reports of the Railroad Commissioners of Massachusetts, and in the *North American Review*. In the report of the Commissioners for January, eighteen hundred and seventy-three, drawn up by him, they discuss the question of the expediency of legislative action, and say:

> "Under the effect of competition, the laws intended to be applicable to one class become applicable to those of another; there is no discrimination as regards special requirements either of localities or of corporations, provided they fall within the lines of classification; and a passenger road may find itself on the same footing as a mineral road; it is almost an impossibility that any measure can be framed at once sufficiently flexible to meet the requirements of so complex a system, and even were it possible to frame it, it is extremely improbable that it could pass the ordeal of any legislative body.
>
> "The final difficulty with all legislation of this class is its excessively dangerous and politically corrupting tendency. It forces the corporations, whether they wish to come there or not, into the lobby of the Legislature and the rooms of committees and Commissioners. They are forced there for the protection of their interests; for the essence of the system is, that certain persons, whether the Legislature itself or officials designated by the Legislature, have devolved upon them the responsibility of establishing the revenues of property belonging to others. The Commissioners have grave doubts of the success of any effort at the regulation of the railroad system which practically effects a separation between the ownership of a railroad and its management."

ILLINOIS REFORMED RAILROAD LAW.

The result of legislative arrangement of freights in Illinois, if the New York *Tribune* and other Eastern papers are to be believed, has not been satisfactory to the people of that State. The currents of business have been disturbed, and important advantages have passed from Chicago and other cities of the State, to rival cities of other States. As this law was the peculiar product of the antagonists of the railroads, devised in the interest of the producing classes; as elections even of Judges have been affected by their construction of it; it is interesting to note its effects as an example of the best that could be done, with recent lights, upon the subject. The principle of the law is that there shall not be a greater charge for carrying freights a certain distance than for a greater distance; preventing any preference to through over local business, to large over small shipments. No attention can be paid to competing lines, or to competing points; and no discrimination in favor of new industries, or to towns seeking to create them. Half a car load left at an intermediate point, at which there is a little business, must not be charged for at a higher proportionate rate than a full car load carried beyond to a general distributing point, or where there is competition with rival roads. One result is that where there are two routes between given points, the shorter must be favored at the expense of the other, though there may be no difference in the running time. The Illinois Commissioners are said to have announced that they understand that this law prohibits discrimination in shipments carried in the State, though made to or from points outside of it. Freights carried across the State must be charged for at the rate of long local freights. As many of the Illinois roads have termini on the east bank of the Mississippi, and by the addition of a mile or two reach the Iowa or the Missouri bank, where they receive traffic of roads from the west, under this tariff Iowa or Missouri must stop shipping their coarse products, or find routes to the east that do not cross Illinois. That being so, the local business of Illinois on such roads must support them, without the help afforded by through freights, and the roads must either carry at a loss, or charge higher local rates. The through freights that paid part of the income of the companies, though the profit on that business was small, under such a law will necessarily be turned off to the Milwaukee and St. Paul and the Lake Superior and Mississippi roads, and grain must be carried up the Mississippi to La Crosse and St. Paul, instead of down to the Dunleith and Fulton, or down the Mississippi to New Orleans. The railroad law of Illinois, as construed, is an impassable barrier to the Iowa and Missouri shipper.

The aim of the Illinois law is to equalize through and local freights. The assumption is made that through freights are profitable, and local freights on the same scale will, therefore, pay. This is independent of the question whether the average of freight is too high or too low. Where a railroad must make as its gross earnings ten thousand dollars per mile to pay the cost of maintenance and a small profit on the investment, if it earns eight thousand dollars by doing the business that is necessarily given to it, it is no injury to those whose business it thus does if it carries other or through freight at a lower rate, to eke out its necessary income, in cars that would otherwise be idle, and at rates at which it would be impossible to do the entire business. So far from being an injury, it is a benefit in that it takes off an expense of two thousand dollars per mile from local traffic. Through freight is generally obtained by sharp competition, and is taken, if it can be moved, at little above the cost of movement; whilst the whole business of a road must not only pay the cost of movement, but also all expenses of wear and tear, maintenance, interest on debt, and on capital. A large through business, at small profit, enables a road to reduce local freights. One of the errors of the Illinois law seems to be that it may prevent through traffic, and divert to the cities and roads of other States a profitable business.

HOW SUCH LAW WOULD OPERATE HERE.

Who is prepared to say that precisely similar results would not follow a similar law here? Before the Pacific Railroad was built, all the exports and imports of Central and Northern California and Nevada passed through the Golden Gate, and were handled by the dealers of San Francisco. The great Panama steamers and numerous sailing vessels crowded the harbor. The city grew with a rapidity only equaled by that of Chicago under the stimulus of its new railroads. Real estate reached a high figure. Every rill of prosperity of the State became an affluent to the tide that enriched the Queen City. When the railroad was completed it stopped the stream of travel to San Francisco that formerly took the Isthmus line. Gradually interior merchants began to find that many articles could be bought cheaper in the East, and brought here by rail, than in San Francisco. The tides of business and of travel measurably changed, and San Francisco suffered somewhat thereby. If there were legislative power in the State to now fix a unit for freight transport, so that freight coming from Ogden should be charged for in proportion to distance, and way and through freights be equalized—if freight paid for the distance it passed over, without regard to competing points, so that companies had no power to discriminate between through and local freight—the result would be that not a pound of freight that could be bought in the East would pass over the railroad from San Francisco to Utah, Nevada, or the mountain towns of California, unless the whole trade were drawn off by the Isthmus. Merchants of Reno, Elko, or Virginia, would have no need of business connections with this State. For example: The local freight from the Eastern cities to Reno is greater than the through freight from those cities to San Francisco, plus that from San Francisco to Reno. Hence Nevada merchants now find it to their interest in many cases to purchase in California. Give them the advantage of less freight to their own towns than San Francisco pays, and they have no need to deal in San Francisco; in fact, cannot afford to do it. Through freights are controlled by competition, and so reduced to the lowest limit. The Panama steamers, Cape Horn, and the Suez Canal, all concur to reduce through rates. Local rates beyond the State line cannot be reached except by Congress. When Congress shall legislate upon this subject, it will be little apt to care whether San Francisco or Chicago gets the trade of the State of Nevada and of Utah Territory.

This question is a little complex, and with your indulgence I will further illustrate it. The combined legislative action of California and Nevada could not effect a relief of the interior from the present discrimination in favor of San Francisco, for two reasons:

First—Such legislation could not reach the roads east of Ogden to the Atlantic that run in connection with the Central Pacific Railroad. For instance, freights at New York for San Francisco, in consideration of their being through freights to the latter city, are charged less rates on the roads between New York and Chicago than would be charged for them if they stopped at Chicago. The same is true as they pass over the roads from Chicago to Omaha, and from Omaha to Ogden; so that the party who sends his freight through to San Francisco, gets it there on special low conditions. The Eastern companies for a time refused to make such arrangements, and there were no overland freights. They consented to it at last, to build up an overland business in opposition to the Isthmus, effecting a large reduction in Isthmus freight charges by the competition. But for points in the interior of this State and Nevada there is no Panama competition, and the Eastern roads refuse to carry freights to be delivered to them at less than the rates which they charge for the ordinary through business. [Sacramento, like San Francisco, is treated as a competing point.] It therefore becomes cheaper to pay the diminished through freights to San Francisco or Sacramento and local rates back than to pay ordinary rates from New York to Colfax, Reno, etc. Under the special through freight system the Eastern roads contract to deliver the goods at San Francisco or Sacramento, put them in sealed cars only to be opened at their destination, and there in good faith they must be delivered. Now, no law passed by these two States could compel these Eastern roads to carry these freights as low when they are to be delivered in the interior as they now do when sent through to San Francisco.

Second—If the principle of the Illinois law is adopted, viz.: that there shall not be a greater charge for carrying goods a certain distance than for a greater distance, and it is construed here as it is there, by the Railroad Commissioners, to apply to all freight carried in the State, even if brought from points outside the State, in effect ignoring Isthmus and other competition, then such contracts as I have referred to with Eastern roads can no longer be made, and the railroad ceases to transport freight overland. It becomes a mere local road. We are thrust back upon the good old times before the railroad, to depend on the Isthmus and Cape Horn; and the Isthmus route, relieved from a sharp competition, can enhance its freights at pleasure. How much cheaper goods can be locally carried in California and Nevada if through freight is shut off may soon be determined.

If Congress should exercise the power that I do not doubt resides in it under the Constitution to regulate fares and freights, and should adopt the principle of the Illinois law as the basis of its action—in other words, abolish the distinction between through and local freights and equalize the charges, so that a uniform addition per mile of rates for all freights must be made—that would necessarily shut off overland freights and give the Isthmus a monopoly of the trade. I may be in error in thus reasoning upon these matters, and if so, desire to be instructed. But my convictions are too deep to be effaced by abuse, and the interests of this State are too deeply involved for its people to be satisfied by general declamation or denunciation in response to specific argument.

GOVERNMENT PURCHASE OF RAILROADS.

There has been no lack of earnestness in denunciation of railroad management and charges, and several plans have been suggested t remedy evils that exist under the present system. I believe, with Mr Adams, that railroad companies cannot be kept out of the lobby, or ou of politics, if the people were continually incited to elect only their "reliable enemies," and projects are discussed and promoted in Legislatures to regulate their business and diminish their revenues, where malice, or even well meaning ignorance, may plunge them into bankruptcy. It may be in view of the necessarily corrupting tendency of attempts at legislative regulation of property interests belonging to others than the State, and the possible injustice that some would intentionally do, that it has been proposed that the Nation should buy and own the railroads. The number of miles of railroad in the United States is sixty-seven thousand one hundred and four, costing $3,159,423,000, of which amount $1,511,579,000 is an existing bonded debt. No one, with a character to lose, will propose confiscation of this property, or otherwise than honest dealings with its owners, if it is to be purchased. The present debt of the United States is about $2,200,000,000. To buy these roads, even at cost, would bring up the debt of the United States to about $5,500,000,000. Such figures are frightful to contemplate, in view of the taxation they would bring. Under the present sharp and, it is said, exacting management, this capital pays to its owners less than four per cent per annum. In the hands of Government employés, who believes it would pay on the whole one dollar revenue? To maintain it would be a continual charge on the treasury, besides $200,000,000 of annual interest on borrowed capital to make the purchase. There is a reasonable jealousy against concentrating power in the hands of the Government. Here would be an addition of a quarter of a million Government employés to manage railroads, make contracts and fatten on the spoils. As in every department of the Government, political considerations would induce the selection of agents. Wielded by one will, or for one purpose, the liberties of the people might well be in danger. The lives and property of the community would be exposed to hazards heretofore unknown. Where would be the remedy for injury to goods or persons? The Government cannot be sued. It would do the business exclusively of a common carrier, without any of his responsibility, and but few of his precautions, now enforced by absolute liability. Railroad building would stop, for the great debt of the Government would preclude its engaging in it; and the theory of its acquisition of existing roads would exclude others from building more. If the Government should undertake to build more roads, Congress would be the arena for a disgraceful scramble of different sections to have roads built for their local convenience. Such an experiment could only be tried where there was a comparative strong government and small territorial area. I have not time to elaborate this point of a prolific subject. The impropriety of the Government buying up the telegraph lines of the country, at a cost of fifty million dollars, to terminate an odious and defiant monopoly, has been strenuously insisted on; the opponents of the scheme denouncing it as unconstitutional and improvident. How much more does the latter objection apply to a purchase involving fifty times fifty million dollars?

A poetical writer has depicted the

RAILROAD OF THE FUTURE,

When the Government should own the roadbeds, consisting of half a dozen tracks, and any one to run his own trains or car over it. It is doubtful if the proposition is seriously advanced. The cost of acquiring the roadbeds of all the railroads in the United States, and multiplying the tracks as proposed, would leave the figures which I have given as present cost, far in the distance. But who would be responsible for the accidents that would result from the irresponsible management of railways on which any man or body of men might run trains? Who would fix time-tables to govern trains of different men, at irregular hours and at varying rates of speed, according to individual whims or interest? Besides the ordinary crowd of officials, State and National, that such a scheme would make indispensable, the number of Coroners would be necessarily largely increased, and solvent accident insurance companies would cease to be possible.

Crude schemes, like these, do not furnish the solution of any difficulties that there may be in this railroad problem.

Again, cheap freights and fares cannot be promoted by such warfare as

PURPOSELY CRIPPLES RAILROADS,

Or adds needlessly greater burdens to those they now sustain. It is a misfortune that some powerful influences, which profess great zeal to reduce railroad charges, are very active in devising modes to make the maintenance of railroads expensive. Any one can recall instances of this inconsistent policy. I will briefly refer to one such instance. In the last Congress a question arose as to whether the Union and Central Pacific Railroads should pay the interest that had accrued on their bonds issued by the Government, and the interest hereafter as it falls due, or whether, under the terms of the contract, the Government was to pay this interest until the maturity of the bonds, when principal and interest is to be repaid by the companies, one half the compensation for transportation done for the United States, however, to be applied as it is earned, on the interest. The amount of bonds issued by the Government to the Central Pacific Railroad Company was twenty-five million eight hundred and eighty-five thousand one hundred and fifty dollars, the annual interest on which is over one and a half millions. Up to this time the company has paid one half of the transportation money on the interest, but there remains due for back interest, which the Government has paid, six million four hundred and nineteen thousand eight hundred and ninety-two dollars. To a California Representative, desiring cheap freights and fares, and the welfare of the State, the question was a momentous one: Shall this matter be so decided that, except for one half the transportation money, this great sum shall be paid by all the people of the United States—a payment easily made by a tax of ten cents per gallon on whisky—or shall it be paid by the people of California alone? If to the annual expenses of the railroad for the next twenty-five years a million and a half dollars are to be added, that sum must be met out of the proceeds of the road. The interest on the six million four hundred and nineteen thousand eight hundred and ninety-two dollars must also be annually paid, bringing up the additional yearly cost of maintaining the road in the future nearly two millions of dollars. To meet the payment, that amount of money must be annually exported from the Sta Does any one suppose that this will not tighten the pressure on o money market? That the interests of the State will not suffer? Th it would disastrously affect only a few railroad Directors? On th Union Pacific the additional annual burden would be about two millio more. Instead of hoping for any reduction of freights and fares, th prospect, with such added burdens, would be at least their maintenanc at present rates, but probably an increase. No advantage would b gained by forcing the present companies into bankruptcy by suc means, for the railroad would either stop running, or any new compan taking it would have to do so with this added burden upon it. In any event the people of this State would be great sufferers. Therefore, as

QUESTION OF STATE POLICY,

To save an injurious burden being laid upon the industrial interests of this State, some of your Representatives contended against the new construction of the liabilities of these companies. For so doing they were roundly abused by the newspaper guardians of the people, who clamor not only for lower freights and fares, but for every expense and injury to those who are to furnish them, which may tend to make compliance with the demand impossible. I looked in vain at the time for any statement in those papers as to the effect of an addition of four millions annually to the expenses of the Pacific Railroad; for any expression of a fear that such an added burden would keep up or enhance railroad charges; for any statement of the law which had to be construed by us under oath; for any recognition of an honest motive on the part of those who were striving to avert the fall of this great load upon the people; for any admission that when the Legislature considered the subject of reducing railroad charges it would have to allow a margin to cover two millions more of necessary expenses per annum. I only learned from such sources that your Representatives were

DESTITUTE OF HONOR AND STATESMANSHIP,

Because, instead of trying to avert, they did advocate this imposition. However desirable for this State that the forty million people of the United States should bear the burden of this interest until the maturity of the bonds, instead of this State only, the duty of your representatives would not allow them to so vote unless in accordance with a reasonable construction of the laws originating the railroad companies. By the original railroad Act of eighteen hundred and sixty-two it was provided that the United States should issue its own bonds to a certain amount, to run for thirty years, and meanwhile for whatever transportation the companies should do for the Government the compensation should be applied on the interest. In eighteen hundred and sixty-four, Congress provided that but one half the transportation money should be applied. By plain legal intendment these statutes mean that any interest money over and above one half the transportation money shall be paid by the Government until the maturity of the bonds, as its aid toward the road. It was a loan of its bonds to that extent; not an indorsement of the bonds of the companies. If there is any doubt about the construction of these laws, ought not your Representatives to give the benefit of that doubt to their own State? Down to eighteen hundred and sixty-nine the Government had no doubt upon it, and held and acted on the theory I have vindicated, when the Secretary of the Treasury raised the question for the first time by withholding all transportation money to apply on the interest. The matter being submitted to Congress, that body, after debate in each house, construed the law as I construe it, and ordered the Secretary to refund one half of the money to the companies. In the last Congress, when the Credit Mobilier excitement had carried nearly every one off his feet and made it dangerous even to do right by railroad companies, the matter was revived and the question was presented not merely of the retention of costs of transportation done for the Government, but the enforcement of payment of all past interest and all that accrues. Under this state of the law and the facts, and the vital interest of this State in the question, it may well be left to those having regard to our domestic welfare what verdict should be passed on the attitude assumed by your Representatives in the Lower House of Congress. Were it necessary I might add to this that by reference to a speech made by one of those Representatives in eighteen hundred and sixty-two, in Congress, on the Pacific Railroad bill then pending, he showed by a table of figures the amount of interest that the General Government would be called on to pay annually under the bill, and treated it as a burden to be met by the National Treasury until the maturity of the bonds, and not by the railroad companies before that time. As this Representative was denounced ten years thereafter as corrupt, for insisting upon the same construction of the law in the same place, this reference may be excused.

If the considerations I have presented upon this matter are not valid, or if the State desires so much to injure the railroad company that it is willing to bear the direct burden of two million dollars, and indirectly two million dollars more annually, for this and the next generation, and sustain any consequent disaster to its business interests, I trust that its will may be clearly expressed, so that those who prefer to be popular rather than right may have notice. On the other hand, if these considerations have weight, it may be hoped that the action they controlled will, in fairness, be ascribed to another motive than mere favoritism to the railroad companies. For myself, even the expressed will of the State would hardly induce me to consent that this great burden should fall upon this people. I had rather resist it, and wait for better times and cooler judgment for vindication. In the face of the present storm I dare say this, and shall act on it.

One other consideration in this connection. The other States, and not California, are the ones to complain, if anybody, of a construction that makes the annual interest a National rather than a State charge. We have here but one eightieth of the population and two and three fifths per cent of the property of the United States, and, therefore, pay but that proportion of the yearly interest, getting back much more than the amount we pay in State and county taxes on railroad property; while other States get no such proceeds from taxation, and we have all the local benefits of the road. Reverse the rule and we pay it all. I know that this frank statement, the necessity for which, I regret, may excite attention in other States, and increase the disposition to force this payment upon us. Yet all the States get the benefit of reduced cost of transportation of mails and Government troops and supplies—this reduction exceeding, by two million dollars annually, the whole amount of yearly interest; with security against costly Indian wars, and the benefit of tranquillity in the center of the continent. The average annual amount paid by the Government before the construction of the railroad for transportation of mails, troops, and supplies, was six million dollars. The whole interest charge is less than four million dollars. The cost of one expedition against the Mormons, before the railroad was built, was greater than five years' interest on all the Pacific Railroad bonds. In case of a foreign war, the benefit to the Nation of the Pacific Railroad, in facilitating the defense and preservation of its Pacific possessions, will be incalculable. In this view it is equitable that the entire Nation, and not this State alone, should bear this load, until the development of the interior, the creation of new States along the line of the road, and the increase of business consequent thereon, enable the Pacific roads to carry out the original intention of Congress and discharge their obligations "at maturity."

UNWISDOM.

In the same spirit as that which seeks to add four million dollars to the annual expense of running the Pacific Railroad, are the efforts made to stimulate the highest taxation of railroad property; to injure the credit of the company by parading its debts and insisting on its insolvency, while inconsistently arraigning it for exacting too great profits from its business; denying necessary facilities for transacting business, and making enmity to it a political test. It may be denied that this is malicious; but if railroading should be cheapened it is, at least, unwise. If it is desirable that more railroads be built in this State, it is unwise. We have one mile of railroad to two hundred and four square miles of territory. New York has a mile of railroad to less than twelve square miles; Pennsylvania, to less than ten; Ohio, to less than twelve; Massachusetts, to less than six. Even Missouri has a mile of railroad to thirty-two square miles—over six times as much as California, in proportion to its area. Capital to build roads must in the future, as in the past, come from abroad. It will not come if capital so invested is made the spirit of popular passion. The counties owe it to themselves to reasonably tax all property within their borders. Property acquired for railroad purposes should be paid for at reasonable rates; and a fair protection to all industrial interests is the duty of legislators. But if five thousand dollars is charged to the railroad company for the use of a wharf in San Francisco, that cannot be made to yield an income of seven hundred in any other way, merely to make it expensive for the company to do business, passengers and freight landed on that wharf must pay the impost. If the utterance of such opinions as these is unpopular, it is because an artificial excitement, and the suppression of truths, have tended to mislead the public judgment.

POOR AGAINST RICH.

There is nothing new in attempts to decry the rich and excite the enmity of the poor against them. Assaults against capital have often been the resources of politicians to advance personal aims. A raid against associated capital is a raid against industry and enterprise. By associated capital the great business interests of the world are conducted, and employment is given to busy millions. This Daniel Webster understood, and he shows through the mists of the past, towering sublimely above the demagogues who would array one class of society against another, as he utters the sentiments I shall quote, on the floor of the Senate:

> "Sir, I see in those vehicles which carry to the people sentiments from high places, plain declarations that the present controversy is but a strife between one part of the community and another. I hear it boasted as the unfailing security, the solid ground, never to be shaken, on which recent measures rest, *that the poor naturally hate the rich.* I know that under the cover of the roofs of the Capitol, within the last twenty-four hours, among men sent here to devise means for the public safety and the public good, it has been vaunted forth, as a matter of boast and triumph, that one cause existed powerful enough to support everything and defend everything, and that was *the natural hatred of the poor against the rich.*
>
> "Sir, I pronounce the author of such sentiments to be guilty of attempting a detestable fraud on the community; a double fraud; a fraud which is to cheat men out of their property and out of the earnings of their labor, by first cheating them out of their understandings."

Mr. Webster proceeded, with magnificent scorn, to denounce the knavery of such pretended friends of the people, and to express his incredulity that the people could be "deluded, cajoled, and driven about in herds," by "tricks so stale, so threadbare, so often practiced, so much worn out on serfs and slaves." He exclaimed:

> "'The natural hatred of the poor against the rich!' 'The danger of a moneyed aristocracy!' 'A power as great as that resisted by the Revolution!' 'A call to a new declaration of independence!' Sir, I admonish the people against the object of outcries like these. I admonish every industrious laborer in the country to be on his guard against such delusions. I tell him the attempt is to play off his passions against his interests, and to prevail on him, in the name of liberty, to destroy the fruits of liberty; in the name of his own independence, to destroy that independence, and make him a beggar and a slave. Has he a dollar, he is advised to do that which will destroy half its value. Has he hands to labor—let him rather fold them and sit still than be pushed on by fraud and artifice to support measures which will render his labor useless and hopeless."

Thus spoke the great statesman on the question of the removal of the deposits. His words are as instinct with truth and power now as then, and as applicable to passing events in eighteen hundred and seventy-three as in eighteen hundred and thirty-three.

I trust the day will come when neither enmity nor friendship to railways will be a test in politics; when, instead of poisonous agencies of disintegration between the farmers, and merchants, and mechanics, and transportation companies, there will be a mutual spirit of fairness and accommodation. The interests of labor and capital, of production and transportation, are interlaced, and all prosper at the same time, and only in the same degree.

NOTE.—The table referred to in the foregoing is given below. I have not the means my disposal to verify its accuracy, but from the high character of the magazine publishing it, presume it is correct.

CENTRAL PACIFIC RAILROAD OF CALIFORNIA.					ILLINOIS CENTRAL RAILROAD.			
No. Miles.........	Between San Francisco and—	First Class, per 100 lbs...........	Second Class, per 100 lbs...........	Third Class, per 100 lbs...........	No. Miles.........	First Class, per 100 lbs...........	Second Class, per 100 lbs...........	Third Class, per 100 lbs...........
		Cts.	Cts.	Cts.		Cts.	Cts.	Cts.
7	Oakland..	6	5	5	Same distance from Chicago.	17.00	14.00	12.00
16	San Leandro..................................	12	7	7		23.00	21.00	18.00
30	Niles..	12	8	8		35.00	28.00	25.00
48	San José.......................................	15	13	11		43.00	36.00	29.00
48	Livermore	15	13	11		43.00	36.00	29.00
82	Lathrop	16	14	12		48.30	38.60	31.60
92	Stockton	16	14	12		48.90	39.20	32.20
104	Lodi	17	15	13		51.50	41.50	34.10
113	Galt...	18	16	14		53.50	43.50	35.30
140	Sacramento	18	16	14		57.20	47.40	37.50
155	Junction.......................................	26	24	22		59.50	49.50	39.50
180	Wheatland	30	28	26		61.00	51.00	41.00
192	Marysville....................................	30	28	26		62.00	52.00	42.00
236	Chico	45	38	36		66.00	56.00	46.00
275	Red Bluff......................................	70	54	50		70.00	60.00	50.00
162	Rocklin...	30	28	26		80.00	50.00	40.00
165	Pino	31	29	27		60.00	50.00	40.00
168	Penryn..	33	30	28		60.50	50.50	40.50
171	Newcastle	35	32	29		61.00	51.00	41.00
176	Auburn	39	36	31		61.00	51.00	41.00
183	Clipper Gap..................................	44	41	31		62.00	52.00	42.00
189	New England Mill.........................	48	45	37		62.50	52.50	42.50
194	Colfax	53	50	40		63.00	53.00	43.00

CLAIMS FOR GOLD MEDALS FOR 1873,

AND

AWARDS OF THE COMMITTEE.

CLAIMS FOR THE GOLD MEDALS FOR 1873.

FIRST DEPARTMENT.

LIVE STOCK.

San Francisco, November 15th, 1873.

Major Robt. Beck, *Secretary State Board of Agriculture, Sacramento:*

Dear Sir: Your favor of tenth instant to Gabilan, reached me at this place to-day only. I claim to compete for the gold medal offered by your Board in the First Department. I exhibited at the late State Fair nineteen head of short-horned Durhams—three bulls and sixteen cows and heifers. I claim that they are the best herd of Short Horns that has ever been exhibited in this State by any one party or firm (as these cattle belong to J. D. Carr and Wm. S. Chapman). I claim that California is almost exclusively a beef country, or a beef-eating community, and that the short-horned Durhams are the *best beef cattle in the world;* and, consequently, that they are more useful and beneficial to California than any other class of cattle, *or any other stock of any kind*, and consequently, they should be awarded the gold medal. I also claim that they are very useful and valuable for milking qualities also. If you think us entitled to the award, let it be to Carr & Chapman, as they own the cattle.

Very respectfully, etc.,

JESSE D. CARR.

SECOND DEPARTMENT.

Sacramento, September 19th, 1873.

To the Committee on Awards of Gold Medals:

The undersigned respectfully submits for your consideration that the Smith patent fingerbar, for harvesting machines, will save its cost in one day's work over any other fingerbar now in use, and can attached at small expense to any harvesting machine, and is therefo one of the most meritorious for agricultural use. It is of Californi manufacture and invention.

C. A. SMITH,
Dixon, Solano County.

D. P. Dunn, Wheatland; G. W. Hoag, Jacinto, Colusa County; E. Taylor, Dixon, Solano County; John O'Brien, Dixon, Solano County Williams & Thomas, Dixon; A. M. Oakley, Wheatland, Yuba County L. B. Adams, Knight's Landing; L. D. Gleason, Grand Island; J. Byers, Grand Island; J. W. Simmons; Grand Island; A. A. Saunder Tremont, Solano County; Willard Bassett, Chico, Butte County; R. W. Elliott, Solano; S. G. Little, Solano; K Guptars, Jacinto.

THIRD DEPARTMENT.

To the President and Board of Directors:

GENTLEMEN: I desire to return my sincere thanks to the Board for th distinguished honor of the gold medal of eighteen hundred and seventy-two, third department, class three, and in making this application on account of the honor last year conferred, shall not be disappointed i the committee see proper to award it elsewhere, although I regard th exhibit of the present season superior to that of last year, and belo append my reasons.

First—This exhibit consists principally of those fruits which, o account of the late season of the society's Fairs, cannot be shown by th fruit growers; but which are as useful to the society's display as th late fruits. This exhibit consists of nine varieties of cherries, grown by Mr. Lewellyng, of San Lorenzo, viz: The "Elton," "Plum Stone," "White Graffin," "May Duke," "Kentish," "Black Tartarian," "Black Eagle," "Pontiac," "Worders Early;" three varieties of Californi oranges, raised by Lewellyng, of San Lorenzo; three varieties of lemons, raised by Lewellyng, of San Lorenzo; two varieties of currants, "May's Victoria," "Cherry Currants," raised by Mr. Lewellyng; one variety nectarines, from Gross Bros., Marysville; five varieties of peaches, from S. Runyon; five varieties of pears, from S. Runyon; eight varieties of plums, from Mr. Cassidy, Petaluma; "Lawton Blackberries," Isaac Bird, San Jose; besides thirty varieties of miscellaneous fruits from last year's exhibit of the Fruit Growers' Association; thirty varieties of miscellaneous bon-bons and confectionery in wax; six of flowers; two of statuary.

Second—This exhibit is made of wax, raised by Mr. Harbison, of Sacramento, and bleached by ourselves.

Third—The artistic merit of the exhibition.

All of which is respectfully submitted.

ANNA GETZ LUCAS.

OAKLAND, October 13th, 1873.

MR. BECK, *Secretary of the Sacramento Fair Committee:*

DEAR SIR: As an applicant for the gold medal, to be awarded to the party showing the highest merit in that department of industry which I represented at the late Fair—"the manufacture of silk ribbons"—I claim to have done more in the way of introducing that business, and showing its practicability and profitableness in this State than any other man. I left California for England two years ago with the express purpose of getting up—in that country where it could best be done—the necessary machinery, with the latest improvements, which I accomplished, by ordering and overseeing the construction of two looms, with all the accompanying apparatus of wheels, jacks, winding-warping, and blocking instruments necessary for the manufacture of all kinds and descriptions of ribbons.

Returning to California with all this machinery completed, I set about the difficult task, which no silk weaver, as I believe, ever attempted before—a task which usually requires four different sets of machinists—that of setting up and mounting an Alabar loom. This work I accomplished successfully. As to the difficulty and the merit of doing this, I name two witnesses, Mr. Lenton, who has been in the trade forty years, and Mr. Cox, of San José, who was a foreman in Coventry for twenty-five years. My looms are in good working order. I claim to have made as good ribbons as can be found in California, from whatever country imported, and that I can make any other quality that might be desired, if the pecuniary means were afforded me. I can show that the business is a very profitable one, if conducted on a proper scale, and that it could afford occupation to hundreds of persons, and good pay.

I have made about two hundred pieces up to the present time. If you could see my machinery at work, you would see the amount of labor I have done, and the proof it affords of what might and ought to be accomplished. The whole cost thus far, in money and labor, has been borne by myself alone. I have often been encouraged by good words, but no one has lent me any material aid. I think that some interest in my enterprise has been awakened by the exhibition of my work at the Fair, and, especially, by the fact that my work was rewarded by the highest premium. Should the gold medal be added to the other honor, it would contribute, I doubt not, to the object which I now have in view—the establishment of my business on a scale equal to its merits.

Yours truly,

JOSEPH GREEN.

Besides the two gentlemen whom I have mentioned, I am permitted to refer you to the Mayor of Oakland, Henry Durant, ex-Mayors Felton and Spaulding, Mr. Henry, President of the Union Bank of Savings, Geo. C. Potter, Thomas W. Antisell, R. F. Ferris, (Member City Council), W. H. Glascock, Chas. Webb Howard, E. Gibbons, Sam. Bell McKee, Edward P. Flint, T. B. Bigelow, Sam. Merritt, P. S. Wilcox, F. K. Shattuck, Walter Blair, John C. Van Wyck, M. D.

SACRAMENTO, September 22d, 1873.

To the Committee on Gold Medals, State Agricultural Society:

GENTLEMEN: In the list of premiums awarded by the Agricultural Society, on the twentieth instant, was one for fifty dollars to Joseph Green, of Oakland, for the best display of ribbons of California manufacture. Understanding that Mr. Green has made application for the society's gold medal, and having been personally acquainted with him for several years, I desire to call your attention to a few facts.

Mr. Green went to Oakland about ten years ago, and being determined to earn an honest living for himself and family, commenced business in a small way by carrying berries around for sale. In a short time, he earned enough to buy a horse and wagon, then a little patch of ground, off which he raised his vegetables, and finally opened a small store. About two years ago, he advanced the idea of manufacturing a first quality of ribbon to supply the California trade, he having been a silk weaver in England. Having received the promise of pecuniary assistance, he went to England and purchased looms of the largest size and finest quality. Upon his return, the parties with whom he had contracted, failed to keep their word with him, and he was forced to undertake the work himself, though already considerably involved. The machinery did not arrive as soon as it was expected, and when it came was considerably damaged by rust. Mr. Green took the machinery to Oakland, and after considerable labor, managed to clean the rust off, and putting it up himself, unaided by any one save his wife and children, commenced the manufacture of silk ribbons.

Although the articles made by him cannot be surpassed, yet he has experienced considerable difficulty in introducing it, having met with a great deal of opposition from the large importing houses, they fearing that if the article was once introduced to the public it would interfere with their other sales.

A committee has already awarded, after a careful examination of the specimens on exhibition, the premium of fifty dollars; and, from one of the committee, I learned that, in his estimation, there was no exhibition of articles which had so clearly earned the gold medal as this.

In order to enable him to carry out his enterprise, Mr. Green mortgaged his little home, which had been acquired by long years of toil, and, unless he can get aid within a short time, the mortgage will be foreclosed, and he and his family homeless. If he can get the medal, it will give his goods a name, and materially aid him in procuring the assistance of capital, and, at the same time, open up a new branch of industry in our State, the fruits of which will not only equal but surpass that of any imported goods, so that it is possible in time for California to be an exporter instead of importer of this class of goods.

If, on an examination of the report made by the Committee on Premiums, and a perusal of this letter, you should determine to award the medal to Mr. Green, I can assure you that by so doing you will greatly aid an honest, sober, and hard-working mechanic, and at the same time offer an inducement for others to follow his example.

I could add more, but fear to encroach on your time.

I remain, very respectfully, your obedient servant,

JOHN H. BURKE.

FOURTH DEPARTMENT.

To the Honorable Committee on Awards of the California State Agricultural Society's Gold Medals:

The undersigned respectfully shows: That he is a resident of the City of Sacramento, engaged in the business of manufacturing and dealing in furniture, bedding, etc.; that he has been a member of the California State Agricultural Society for the current year, and for a number of years last past; that he was an exhibitor at the society's Fair, held in this city during the week ending September twentieth, of this year, and as such, exhibited the following articles of furniture:

One laurel walnut trimmed office desk, with revolving shelves.
One walnut lady's desk.
One laurel rocking chair, upholstered in silk.
Two laurel easy chairs, upholstered in silk.
One laurel walnut trimmed bedstead.
One laurel dress case (bureau).
One laurel washstand.
One laurel somino.
One sick chair.
One walnut pillow lounge.
One walnut office chair.
Two walnut gilt-embroidered chairs.
One walnut glass-door wardrobe.
Two parlor sets, fourteen pieces, in silk brocatel.
One walnut marble-top side table, gilded.

That he made due entry of said articles to compete for the society's gold medal offered for the most meritorious exhibition in the Fourth Department, as classified in the society's schedule of premiums, and therefore submits the following claims to be awarded such gold medal:

1. That the articles exhibited, as above stated, are the product of home industry and manufacture, and are made out of the products of this State, so far as such products are obtainable.
2. That such furniture is a specimen of the work being daily and constantly done at his manufacturing house, Nos. 154, 156, 158, and 160 K street, in said city.
3. He claims that the workmanship displayed by said exhibition is superior, and deserves commendation at the hands of this honorable committee.
4. That it requires a very large capital to conduct and maintain his manufacturing shops, as will be readily understood by this committee when informed that the articles exhibited, as above stated, cost him the sum of three thousand seven hundred dollars.
5. That his said business furnishes employment to from ten to fifty artisans and workmen—artisans and workmen of the highest caliber—commanding from three to four dollars per day for their services.
6. That he has to compete with Eastern and foreign manufactories, and ought to be encouraged in his competition, in order that the prices of those articles contributing so much to social and domestic comfort and happiness, may be reduced.

7. That, for a number of years last past, he has, at great expense, exhibited articles of his manufacture and samples of his workmanship at the society's Fairs, with the view of promoting the manufacturing interests of this State.

8. This claimant represents that, with suitable encouragement and recognition, extensive factories for the manufacture of furniture and bedding, etc., can be established, furnishing employment to a large number of artisans, and redounding to the interests of the State; and with such encouragement, this claimant believes he will be enabled to organize such an institution in Sacramento; wherefore, he submits his claims to the favorable consideration of your honorable committee.

JOHN BREUNER.

Dated at Sacramento, October 25th, 1873.

SACRAMENTO, September 20th, 1873.

To the Committee on Gold Medals, State Fair, eighteen hundred and seventy-three:

GENTLEMEN: We beg to lay before you our claim to the society's gold medal for the most meritorious exhibition in the Fourth Department. The grounds for our claim are as follows:

First—The large number of our entries, being twenty in the Fourth Department, besides nine in other departments, and five special entries.

Second—Our magnificent display of California manufactured cordage, which, for quality and workmanship, cannot be excelled anywhere. The collection embraces the two largest coils of rope ever manufactured in the State, and equal to the largest ever made in the Eastern States. This collection of ropes has been made with great care and is deserving of your best consideration.

Third—Our display of brass goods, which we think will be admitted the most extensive and complete ever exhibited in California, comprising almost everything from a common beer faucet to the finest and minutest steam goods manufactured.

Fourth—Our display of mechanical tools, which is also quite exhaustive. In this collection the engineer and machinist, carpenter, cabinet-maker, blacksmith, lumberman, and other mechanics can find their supplies, besides many other tools quite new to them.

Fifth—Our general display of hardware, which we claim to be the most varied and extensive, and therefore the most interesting display, to the general public, throughout the whole of the Fair; the collection has the greatest number of novelties and is more useful than any other display in the department.

Sixth—Our collection exhibits the workmanship and success of the greatest number of branches of industry, and although our display necessarily contains much that is of Eastern and foreign manufacture (no attempt having yet been made to manufacture them locally), we think our display will act as an incentive to our manufacturers, and at the same time furnish them with designs and patterns for their guidance.

Seventh—Our special entries, which alone are a meritorious display, and one deserving of your best consideration.

And finally, we would point out to you that our exhibition is spread over several departments, which places us on an unfair footing in competing for the gold medal; we think our collection ought to be considered as a whole, and not simply confine us to our exhibits in the Fourth Department; but, apart from this, we rest our claim on the reasons given above, and feel satisfied the matter will have your ample consideration.

HUNTINGTON, HOPKINS & CO.

SACRAMENTO, September 20th, 1873.

GENTLEMEN: In presenting my claim for the gold medal for the "Cumming Lock Nut" (the right of which I control in all States and Territories west of the Rocky Mountains), in the Fourth Department, I respectfully submit to your consideration the following claims of superiority above all other bolts.

1st. Simplicity: The principle being obvious, and readily understood and applied by the most inexperienced laborer. The "nut lock" is positive in its action; securely fastening the nut to the bolt, at any point desired, without reference to surrounding parts, and not depending upon friction, elasticity, or any other uncertain element.

2d. Cheapness: Being cheaper than any known device for the purpose—the railroad track bolts costing only one and a half cents each more than a common bolt.

3d. Effectiveness: Having been thoroughly tested during the past four years, in every conceivable position, and not a single bolt has ever been known to fail.

4th. Durability: The bolts being always firm in their position, the friction is greatly reduced, and their durability doubled.

5th. Universal adaptation: Being applicable to bolts of any size, or in any position, and equally useful for railroad tracks, cars, engines, bridges, machinery, carriages, agricultural implements, reapers, mills, elevators; in fact, everywhere that bolts and nuts are used.

6th. Adjustability; Being readily adjusted with a wrench at any time, and the nut removed and replaced as often as desired, without injury to either bolt or nut.

7th. Correctness of principle: The action of the nut in cutting its own thread in the soft metal key, causes all the slack between the bolt and nut to be taken up, utilizes the whole strength of the threads of both nut and bolt, prevents any rocking motion of the nut upon the bolt, thus saving wear upon the threads, and causing the whole strain upon the bolt to be coincident with its axis, and not at any angle thereto.

The economy of using these bolts is evident from the foregoing statement, and varies, of course, with the uses to which they are put. Experience has shown, that in their use as "track bolts" upon railroads, their whole additional cost is repaid in ninety days, by the one item of saving in wages of the "section hand," employed in screwing up loose nuts, besides the great saving in wear and tear of track and rolling stock, which is incalculable. The increased safety and durability of cars, carriages, and machinery of all kinds, fitted with these bolts, is too obvious to require comment; and it is the only device known th will infallibly correct the tendency of nuts to shake loose upon iron a wooden railway bridges. These bolts are used on ninety railroads.

Yours, respectfully,

JAMES KIP.

SACRAMENTO, November 12th, 1873.

State Agricultural Society and Gold Medal Committee:

GENTLEMEN: We applied for the gold medal offered by the society, i the Fourth Department, for the best display of brass goods, which were all of Calfornia manufacture, consisting of the following articles: Twenty-four different patterns of padlocks; railroad, ship, and store locks; thirteen different styles of door locks, and other brass articles, consisting of meter cocks, service cocks, hose bibbs, hose couplings, and four different patterns of beer faucets, and a sample of our brass castings for locks.

All of which is respectfully submitted.

ADAMS & WADSWORTH,
No. 73 J street, Sacramento.

To the Committee on the Gold Medal for the Fourth Department:

GENTLEMEN: We desire to be considered an applicant for the society's gold medal of the Fourth Department, for having made the most meritorious display in that department, and, as a basis of our claim, we respectfully show as follows, to wit: We exhibited six safes, manufactured by Hall's Safe and Lock Co., weighing twenty-three thousand six hundred pounds in the aggregate, and consisting of three varieties, viz.: two purely burglar proof, two purely fire proof, and two fire and burglar proof combined.

We also displayed designs and drawings, showing accurately the construction of our safes and locks, so that they might be thoroughly understood. And we further call your attention to our display of bank locks, all of our own manufacture (not being displayed by any other exhibitors in this line); also specimens of conical steel bolts, solid welded corners of steel and iron, drill proof steel plates, combined with iron (these being the first ever exhibited on this coast at any Fair), specimens of the fire proof filling of our safes, and many other articles pertaining to the design and contruction of safes and locks—our entire display costing us three hundred dollars.

In presenting the above for your consideration we have simply stated facts, and while we claim the best display in the Fourth Department, you will please remember that our articles are not easily moved and transported as smaller articles are; yet you will at once see from the nature of our articles, that it would be difficult to present a numerous variety as others did in this department, of smaller and lighter articles. And we feel assured, gentlemen, that you will admit the importance of obtaining perfection in this line, as it protects the savings and wealth of all classes from the hands of those who would rob and steal.

While we are fully satisfied that our exhibition exceeded the value of all the articles exhibited on that floor, and attracted the attention of large numbers of visitors, we are willing to leave the matter in your hands, and willingly abide your decision. For further reference please see inclosed circulars.

We remain yours, very respectfully,

HALL'S SAFE AND LOCK COMPANY.
By W. G. WILLIAMS, Agent.

SACRAMENTO, September 18th, 1873.

To the Committee of Awards on Articles of California Manufacture, Class Seven:

GENTLEMEN: In placing our long established H. & L. axle grease again on exhibition, we are emboldened to ask that our manufacture shall receive your special attention.

For over twenty years our brand (H. & L.) has been before the public, where it has won for itself a widespread reputation, and we claim that no single article of manufacture has ever before attained the popularity and favor which has attached to the H. & L. axle grease—since its first inception in eighteen hundred and fifty-three—not only in California, but throughout the neighboring States and Territories.

In view of the above facts, we respectfully claim from you, as a crowning triumph, that you should place our invention among the highest awards offered by the State. We feel that we have honestly earned, and are honorably entitled to that distinction at your hands, for however humble the invention in itself, it has proved of more real value in its application as a lubricant than any and all of the spurious imitations which have so constantly been brought to bear against it.

Placing confidence in your justice and liberality, in giving our claim your most careful consideration, we are, gentlemen, yours, very respectfully,

HUCKS & LAMBERT.

FIFTH DEPARTMENT.

SACRAMENTO, September 19th, 1873.

To the Honorable Board of Directors of the State Agricultural Society, and Committee on Gold Medals:

The undersigned, Mrs. J. P. Odbert, would represent and show that she was an exhibitor at the present State Fair, of canned fruits, preserves, jellies, pickles, brandy peaches and pears, catsup, and claims and presents her petition for a gold medal, in addition to the premiums to which she may be adjudged.

Exhibit No. 1. I exhibit thirty-two varieties of canned fruits, as per schedule No. 1.

No. 2. I exhibit thirty-one varieties of preserves, as per schedule No. 2.

No. 3. One hundred and eleven glasses containing forty-eight varieties of jellies, as per schedule No. 3.

No. 4. Forty varieties of pickles, as per schedule No. 4.

No. 5. Two varieties of brandy peaches, and two varieties of brandy pears.

No. 6. Also, exhibit four varieties of catsup, see schedule No. 6, hereunto attached. All these are in the Fifth Department.

All these are the work and labor of my own hands, done the present fruit season, at my home, near the City of Sacramento. I trust that the committee will recognize my claim or petition for a gold medal, which, if awarded, I will ever prize as an heirloom to be handed down to my children.

Respectfully,

MRS. J. P. ODBERT.

SCHEDULE TO PETITION FOR A GOLD MEDAL.

No. 1—Canned fruits: Huckleberry, elderberry, tomatoes, blue fig, blue plum, Bartlett pear, yellow freestone peach, white freestone peach, yellow clingstone peach, quince, sweet apples, white nectarine, Bartlett pear, sour apple, blue nectarine, egg plum, currants, muscat grape, white clingstone peach, red plums, white blackberries, black Tartarian cherry, apricot, crabapple, blackberry, white Malaga fig, gooseberry, pie plant, strawberries, pie melon, pineapple.

No. 2—Preserves: Gooseberry, blue fig, white clingtone peach, white Malaga fig, French prune, citron, Bartlett pear, black Tartarian cherry, egg plum, muskmelon banana, elderberry, yellow freestone peach, white cherry, currants, canteloupe, strawberry, watermelon, crab apple, tomatoes, apricot, blue nectarine, blue plum, yellow clingstone peach, white nectarine, muscat grape, oranges, pineapple, quinces, apples, blackberry.

No. 3—Jellies, forty-eight varieties: Orange, pie plant, tomato, French prune, wild grape, pineapple, strawberry, crabapple, apricot, white blackberry, apple flavored, watermelon, German prune, white Malaga fig, egg plum, canteloupe, blue damson plum, Bartlett pear, white muscat grape, huckleberry, cucumber, Black Prince grape, blackberry, lime, gooseberry, nectarine, black raspberry, elderberry, green gage, quince, Rhode Island greening, red Tremanis grape, blue fig, currant, peach, Los Angeles grape, blackberry, lemon, limbertwig apple, plum (variety not known), cranberry, muscat wine, pomegranate, bell Agatha cherry, white oxheart cherry, Roxbury russet apple, Barbary rose grape, quince.

No. 4—Pickles, forty varieties: Citron, martenoes, red cabbage, Los Angeles grape, limes, China beans, egg plant, peppers, okra, muscat grape, canteloupe, oranges, red onions, mixed pickles, plain pickled cucumbers, blue plum, apples, white onions, mushrooms, olives, gherkins, nasturtion seeds, tomatoes, nectarines, white freestone peach, yellow freestone peach, cauliflower, asparagus, apricot, white clingstone peach, yellow clingstone peach, egg plant, white cabbage, Bartlett pear (two jars), blue fig, China cucumber, eggs, beets, wallies or Digger Indian nuts, artichokes, two varieties of China pickles.

No. 5—Brandy fruit: Bartlett pear, Duchess d'Angeuleme, white clingstone peach, yellow clingstone peach.

No. 6—Catsups: Tomato, cucumber, mushroom, plum.

To the Honorable Committee on Gold Medals:

GENTLEMEN: We have on exhibition some samples of beet sugar, manufactured by the "Sacramento Valley Beet Sugar Company," for which we desire to receive the gold medal of the Fifth Department, for the most meritorious exhibition of sugar in that department.

We claim, firstly, ours to be the most meritorious display, on the grounds that it is sugar manufactured in California, out of beets grown in California, and that its success and the introduction of so great a branch of industry as the manufacture of beet sugar in this State is entirely due to the efforts, exertions, and perseverance of the managers of the Sacramento Valley Beet Sugar Company.

Secondly, we claim that the sugar manufactured by this company is far superior to all other sugar on this coast, as it is free of all alkaline matter, dust, or other adulterations, and being a genuine article, excels in sweetness, quantity, and quality.

You will please also consider that the sugar-making interest is one of the most important of our home productions, and that there are many men in our midst who depend entirely upon their handiwork for support, and to many such we are constantly giving employment, employing at the present time about five hundred men, and continually increasing our force and enlarging our works as the times command.

That this enterprise, which is as yet in its infancy on this coast, is deserving of your attention and encouragement, is obvious. We therefore kindly submit our claims for the gold medal to your honest judgment.

Respectfully yours, etc.,

SACRAMENTO VALLEY BEET SUGAR COMPANY,

Per A. J. WETZLAR, Secretary.

SIXTH DEPARTMENT.

To the Committee on the Award of Gold Medals:

GENTLEMEN: In the Sixth Department, I claim that I make the most meritorious exhibition, and that which represents an industry which, if fostered and encouraged, will eventually prove to be one of the most valuable productions of our State, viz: dried and preserved fruits. I had on exhibition twenty-two varieties under glass, and several hundred pounds in uniform packages, as it is prepared for market—more in quantity than all other exhibitors combined—and received from a discriminating committee a majority of the premiums offered by the society. I believe the business of fruit drying to be one of the greatest prospective value of any industry represented in this department, which is a strong argument in favor of its receiving the gold medal.

Respectfully submitted by E. F. AIKEN.

To the Awarding Committee of the Gold Medal:

GENTS: In accordance with the rules of your society, I, in brief, present some of the reasons for my claim to the gold medal offered for the most meritorious exhibition in the Sixth Department of your list of premiums.

My table contained over one hundred distinct and named varieties of apples, and seventy-five distinct varieties of pears, in cultivation by nurserymen, embracing those not suited to our soil and clime, as well as those best adapted to it, thus enabling the observing tree planter to choose for himself what he will plant, instead of depending upon the tree peddler to select for him. Among the pears was one plate of seckels, which the universal verdict of all the fruit growers present pronounced the largest ever exhibited, measuring ten and one half inches in circumference. Also, in the great variety, representing as many or more of the varied fruits and nuts as all the other exhibitors of green fruits, consisting of apples, pears, quinces, peaches, plums, nectarines, grapes, and of the tropical fruits: the orange, lemon, olive, fig, pomegranate, and prickly pear; of the nuts, California walnuts, English walnuts, Italian chestnuts, and almonds; furnishing a collection interesting and instructive to the citizen and instructive to the stranger; showing a greater variety of the products of the temperate and tropical zone grown in one locality, and in greater perfection, than can be exhibited in any country outside our favored State.

Respectfully submitted. D. C. YOUNG.

SEVENTH DEPARTMENT.

To the Committee on Award of Gold Medals by the State Agricultural Society for the State of California:

GENTLEMEN: We, the undersigned, claim that we are entitled to the award of the gold medal offered for the most meritorious exhibition in the Seventh Department, for the following reasons:

First—We had the largest variety and most artistically executed work in marble ever exhibited at any Fair held in the State.

Second—For the reason that, in monumental work, every design was original, and executed in the highest style of art.

Third—That all work exhibited by us would bear the closest criticisms, both as to proportion and execution.

Fourth—That out sculpture of spread-wing doves required more skill and art than any piece of work in marble ever exhibited at a Fair in this State, maintaining their true proportions in every particular.

Fifth—Because our exhibition was of more moneyed value than ever exhibited at our State Fairs, in the line of fine arts.

Sixth—For the reason that we spared neither time or money to make the exhibition in our department worthy of the State.

Seventh—Because the larger portion of our exhibit was wrought in California marble, thus displaying our resources, in producing a marble as fine in texture and capable of greater relief than any other marble produced in any part of the world.

All of which is respectfully submitted for your consideration.

AITKEN & LUCE.

SAN FRANCISCO, September 22d, 1873.

To the Committee on Gold Medal Awards:

GENTLEMEN: I respectfully enter my exhibit of oil pictures for the gold medal to be awarded in the art department, and base my claims as follows: For the best collection of paintings; for the best landscape in oil; for the best fruit piece; for the best oil painting; all of which received first premiums.

Very respectfully,
NORTON BUSH.

REPORT OF GOLD MEDAL COMMITTEE FOR 1873.

To the California State Board of Agriculture:

GENTLEMEN: We have the honor to report the result of our examination and conclusions, as follows:

GOLD MEDAL, FIRST DEPARTMENT—LIVE STOCK.

The medal in this department was awarded to Carr & Chapman, Gabilan, Monterey County, California, for their herd of short-horned Durham stock.

D. M. REAVIS,
E. C. SINGLETERRY,
Committee.

SECOND DEPARTMENT—To Pollard & Carvill, San Francisco, California, for carriages.

THIRD DEPARTMENT—To Jos. Green, Oakland, California, for silk ribbon.

FOURTH DEPARTMENT—To John Bruener, Sacramento, California, for California manufactured furniture.

FIFTH DEPARTMENT—Sacramento Valley Beet Sugar Company, for sugar.

SIXTH DEPARTMENT—D. C. Young, Sonoma, California, for fruit.

SEVENTH DEPARTMENT—To Aitken & Luce, Sacramento, California, for marble work.

E. B. KENYON,
H. M. LARUE,
WM. KIRK,
DUNCAN BEAUMONT,
P. H. RUSSELL,
Committee.

CORRESPONDENCE.

SACRAMENTO, September 22d, 1873.

To the Honorable the Board of State Agriculture, per ROBERT BECK, *Secretary.*

GENTLEMEN: Notice of your very kind resolution and one hundred dollars for my services during the Fair, have been duly received by me, for which I return many thanks. Your vote of thanks I appreciate and accept. Inclosed please find the one hundred dollars, which I beg the privilege of returning to the society, and take as much pleasure in so doing as you did in presenting the same.

Predicting for the society many years of success in its noble undertaking,

I remain, gentlemen, yours, with much respect,

MRS. HORACE ADAMS.

CONSULATE OF JAPAN FOR CALIFORNIA, U. S. A.,
SAN FRANCISCO, January 5th, 1874.

ROBERT BECK, ESQ.,
Secretary State Agricultural Society,
Sacramento, California:

DEAR SIR: I am in receipt of your letter making inquiry as to the quantity of stock, horses, and sheep that have been sent to Japan from this port during the past two years.

Not having statistics of the number shipped by other parties, I can only give you a statement of such animals as were shipped by myself during the period named, viz:

Cows and bulls	86
Horses	11
Mules	2
Sheep	174
Jack	1

So far as my observation goes, I think there must have been on the (40) forty steamships sailing for Japan during the period named, sent by outside parties, an average of say four horses, and ten cows and bulls, in addition to those shipped by this Consulate. There were a very few sheep and swine sent, also (probably not fifty head of both), during the same period.

The demand for beef in Japan is fast reducing the native stock of cattle, prices for which are reported as being nearly double those prevailing some two years since. Plans are now being made for importing and raising both beef and dairy cattle in Japan, and probably the present year will see all the steamers running to Yokohama carrying full deck loads of cattle, say thirty head per steamer.

Hoping the above will answer the purpose you desire,
I am, very respectfully,
Your obedient servant,

HORACE D. DUNN,
Acting Consul of Japan.

BIENNIAL REPORT

OF THE

SURVEYOR GENERAL

FROM

DECEMBER, 1871, TO AUGUST, 1873.

To His Excellency,
NEWTON BOOTH,
Governor of California:

SIR: I herewith beg leave to submit the following report of my official transactions, from December fourth, eighteen hundred and seventy-one, to August first, eighteen hundred and seventy-three.

I am, very respectfully, your obedient servant,

ROBERT GARDNER,
Surveyor General and ex officio Register of the State Land Office.

REPORT.

The State of California, commencing at about thirty-two degrees thirty minutes north latitude, extends north to the forty-second parallel, having an average width of about four degrees, and covers an area of about one hundred and eighty thousand square miles, or about one hundred and twenty millions of acres. So far as shown by the records of my office, there are about five thousand government townships in the State (whole and fractional); of these, two thousand two hundred and eighty-four have been surveyed by the United States, prior to January first, eighteen hundred and seventy-three, the remainder being unsurveyed. The State of California, under the several Acts of Congress, is granted the following lands:

First—Under the eighth section of the Act of September fourth, eighteen hundred and forty-one, the State is granted five hundred thousand acres for the purposes of internal improvement.

Second—Under the fourth section of the Act of September twenty-eighth, eighteen hundred and fifty, the State is granted all the swamp and overflowed lands within her border.

Third—Under the sixth section of the Act of March third, eighteen hundred and fifty-three, the State is granted the sixteenth and thirty-sixth sections in each township, or indemnity therefor in cases where the State cannot perfect her title, by reason of Spanish grants or prior sales by the United States. This grant comprises one eighteenth ($\frac{1}{18}$) of all the land in the State, or an aggregate area of about six millions of acres.

Fourth—Under section twelve, of the same Act, the State is granted seventy-two sections, or forty-six thousand and eighty acres, for the use of a seminary of learning.

Fifth—Under the thirteenth section of this same Act, the State is granted ten sections for the purpose of the erection of public buildings.

Sixth—Under the Act of July second, eighteen hundred and sixty-two, and Acts amendatory thereof, the State is granted one hundred and fifty thousand acres for the benefit of agriculture and the mechanic arts.

In addition to these grants, the State, by virtue of her sovereignty, is the owner of all the salt marsh and tide lands within her borders.

GRANT OF SIXTEENTH AND THIRTY-SIXTH SECTIONS, AND LANDS IN LIEU THEREOF.

On entering upon my official duties, the files of my office contained a large number of unapproved applications under this grant, made during the administration of my predecessor. An examination of these applications disclosed the necessity of procuring from the several United States Land Offices, certificates as to the condition of the lands applied for. These certificates were obtained, and wherever practicable, the applications on file were approved.

During the twenty months ending August first, eighteen hundred and seventy-three, I have issued approvals of two thousand one hundred and thirteen applications for school lands, embracing five hundred and eighty thousand eight hundred and nine acres; these lands being principally situated in the Counties of Los Angeles, San Bernardino, San Diego, Kern, Fresno, Tulare, Mono, Inyo, Siskiyou, Lassen, Shasta, and Tehama.

Payment has been made, as required by law, upon two hundred and fifty-nine thousand five hundred and twenty-five acres of the land, for which such approvals were issued, which payments, consisting of twenty per cent of the purchase price, and one year's interest upon the unpaid balance, amount to about seventy-five thousand dollars.

Applications embracing an area of three hundred and twenty-one thousand two hundred and eighty-three acres, have been forfeited for non-payment, and the land has reverted to the State, as provided by law. The aggregate of these forfeitures is large, but is attributable, generally, to natural causes. During the years eighteen hundred and sixty-eight and eighteen hundred and sixty-nine, much excitement existed upon all matters relating to real estate in California, and consequently a large field was open for speculation. Lands were applied for indiscriminately, with very little regard to location, value, or quality, with the expectation of realizing largely from future sales thereof. Since that time there has been a reaction, and real estate, for speculative purposes, has commanded neither ready sale nor prices commensurate with its value. Hence, when this large number of approvals was made by me, and the applicants compelled to make payment for the lands applied for, circumstances did not seem to them to justify the expenditure, except in instances where lands were of known value. Most of these forfeited lands—except where known to be valueless (as in the Mohave Desert)—have been reapplied for, and, under more favorable circumstances, the State will eventually realize from their sale.

There have been filed in my office, from December fourth, eighteen hundred and seventy-one, to August first, eighteen hundred and seventy-three, applications under this grant for lands embracing an area of seven hundred and twenty-four thousand eight hundred and seventy-eight acres. These applications have (when practicable) been approved by me, and in most instances payment made thereon.

A large number of contested cases which had accumulated, I have disposed of, approving some and rejecting others. I have rejected over nine hundred applications, from which rejections no appeals have been taken, and in which my action has been final. Fifty-six cases of conflict have been certified by me to the proper Courts for judicial determination.

There have been received from the General Land Office, at Washington, during my term of office and prior to August first, eighteen hundred and seventy-three, lists embracing in the aggregate ninety-nine thousand nine hundred and twenty acres, certified by the United States to the State of California, in lieu of or as indemnity for sixteenth or thirty-sixth sections, which have been lost to the State. The total number of acres certified to the State under this grant is four hundred and fifty-eight thousand seven hundred and seventy-seven.

Since the first of January, eighteen hundred and seventy-three, but few applications for lands in lieu of sixteenth or thirty-sixth sections have been made. This is accounted for by the fact that applications had been made prior to that time for an amount of land nearly equaling in area the lands lost to the State, and for which she would, under the prevailing construction of the grant, be entitled to indemnity. Also, upon the date last mentioned, section three thousand five hundred of the Political Code went into effect, providing that no applicant of this class should be allowed to purchase more than three hundred and twenty acres, while before that time there was no limit or restriction as to quantity.

I desire at this time to call your attention to the terms of this grant, which, as expressed by Congress, appear to me to be absolute and positive, without conditions or reservations. And I am of the opinion that title to these lands passed to and became vested in the State at the time of the grant, the subsequent survey thereof by the United States operating merely as a partition and segregation of State lands from those of the public domain. I am supported in this opinion by judicial authorities of the highest order, and by logical conclusions, having for their premises the terms of the grant itself. All other grants made to the State by the United States, reserve to the United States the lands of a mineral character, while this grant does not. The Act of Congress, in making this grant, allows the State indemnity only for such of the sixteenth and thirty-sixth sections as have been lost to the State by reason of prior grants or preëmption, but provides no indemnity for loss to the State occasioned by the mineral character of the land granted. About one third, or two millions of acres of this grant, is located within the mineral belt, and had Congress intended a reservation thereof, it is reasonable to presume that the Act itself would have, in terms, expressed it, and protected its grantee by providing indemnity for the loss. On the part of the State, therefore, submission by her to any ruling of the General Land Office recognizing the right of the United States to make such reservation, will necessarily be followed by a pecuniary loss of such magnitude that it becomes imperative that any such reservation, or any action of the United States General Land Office tending to recognize such reservation, be resisted with energy and promptness, and be submitted to only when so decreed by the highest tribunal. I will refer, in support of my position in this behalf, to the recent decision of the Supreme Court of this State in the case of *Sherman* v. *Buick*, as, also, to the cases of *Higgins* v. *Houghton*, 25 Cal., p. 255; *Doll* v. *Meactor*, 16 Cal., p. 296; and *Van Valkenberg* v. *McCloud*, 21 Cal., p. 330. The Supreme Court of the United States has also made frequent decisions tending to the same end, as in the case of *Cooper* v. *Roberts*, 18 Howard, p. 173, and many others of like character.

Admitting my position to be correct, and the grant to be as contended—a grant "in presenti"—the title passing to the State at the date of the grant, State legislation is required for the protection of settlers upon sixteenth and thirty-sixth sections, who have purchased from the United States, and for whose lands the State has received indemnity. An Act relinquishing the right of the State to such lands, and granting them to the purchasers thereof from the United States (excepting, of course, in cases where said land has been sold as mineral), would be but equitable, offering every protection to the settler, and carrying out the policy of our Government.

GRANT OF FIVE HUNDRED THOUSAND ACRES.

There has been certified over to the State by the United States, under the grant of five hundred thousand acres for internal improvements, from December fourth, eighteen hundred and seventy-one, to August first, eighteen hundred and seventy-three, thirty-nine thousand four hundred and thirty-eight acres, making the total of lands certified to the State under this grant, prior to August first, eighteen hundred and seventy-three, four hundred and thirty-seven thousand one hundred and eighty-three and sixty-two one hundredths acres.

I have received and filed twenty-two warrant applications under this grant, amounting to eight thousand three hundred and ninety-five acres.

GRANT OF SEVENTY-TWO SECTIONS.

There has been certified over to the State by the United States, from December fourth, eighteen hundred and seventy-one, to August first, eighteen hundred and seventy-three, sixteen thousand eight hundred and twenty-five acres; and the total number of acres so certified under this grant prior to August first, eighteen hundred and seventy-three, is forty thousand six hundred and four, or very nearly all of the grant.

GRANT OF TEN SECTIONS.

The total number of acres certified to the State under this grant is three thousand two hundred and three, being about one half of the grant.

SWAMP AND OVERFLOWED LANDS.

The United States has listed to the State under this grant, from December fourth, eighteen hundred and seventy-one, to August first, eighteen hundred and seventy-three, three hundred and ninety-four thousand one hundred and forty-four acres; and has, during the same time, patented to the State lands that had been previously listed, amounting to three hundred and fifty-six thousand one hundred and forty-three acres. The total amount of this class of land listed to the State prior to August first, eighteen hundred and seventy-three, is one million four hundred and twenty-three thousand five hundred and thirty-one acres. And the total amount of land patented by the United States to the State previous to said date, is one million two hundred and one thousand five hundred and seventy-one acres—the patenting having very nearly kept pace with the listing.

GRANT OF ONE HUNDRED AND FIFTY THOUSAND ACRES.

There has been certified thus far to the State under this grant, thirty-two thousand six hundred and twenty-four acres. I am unable to give information as to the disposition and sale of lands under this grant, as the management of the same is in the hands of the Board of Regents of the University of California.

MISCELLANEOUS.

The grant of five hundred thousand acres has all been sold by the State, with the exception of such portions thereof as are reserved for location under outstanding school land warrants. The grant of seventy-two sections, and the grant of ten sections, have all been sold.

PATENTING OF LANDS.

From December fourth, eighteen hundred and seventy-one, to August first, eighteen hundred and seventy-three, there have been issued to purchasers from the State, patents for four hundred and thirteen thousand five hundred and fifty-six (413,556) acres of State lands, as follows:

Grant of sixteenth and thirty-sixth sections, one hundred and sixty-one thousand nine hundred and sixty-three acres.

Grant of five hundred thousand acres, thirty-six thousand four hundred and sixty-nine and twenty-seven one hundredths acres.

Grant of seventy-two sections, five thousand one hundred and fifty-two and forty-three one hundredths acres.

Grant of ten sections, four hundred and eighty acres.

Swamp and overflowed lands, two hundred and seven thousand six hundred and eighty-two and ten one hundredths acres.

Tide lands, one thousand eight hundred and nine and twenty one hundredths acres.

REGISTER'S CERTIFICATES.

I have issued certificates for the return to purchasers of moneys paid by them to the State on account of the purchase of State lands, amounting in the aggregate to seventeen thousand five hundred and twenty-two dollars and sixteen cents ($17,522 16). Of this amount, fifteen thousand and seventy-one dollars and seven cents ($15,071 07) being payable out of the School Land Fund, and two thousand four hundred and fifty-one dollars and nine cents ($2,451 09) out of the Swamp Land Funds of the several counties. In the majority of instances, these certificates have been issued upon old unsurveyed locations in the San Francisco Land District, which have since proved not to be the property of the State. These certificates are issued as provided in section sixty-three of the Act of eighteen hundred and sixty-eight and its subsequent amendments, and in section three thousand five hundred and seventy-one of the Political Code.

STATE AGENCY AT WASHINGTON.

Under the provisions of the Act of the Legislature of this State, passed April first, eighteen hundred and seventy, entitled "An Act to perfect title to lands granted by the United States to the State of California," the Surveyor General was directed to appoint an agent to represent the State before the General Land Office in procuring the listing to the State by the United States of the lands applied for under the several grants. This Act has been perpetuated by the Codes, and the State has continuously been so represented by its agent. At the time of the passage of said Act, the claims of the State before the Department of the Interior were involved in much confusion, and purchasers were much harassed by long and perplexing delays in procuring title. Many conflicts existed between the United States and the State, and the emergency required, on the part of the State, a personal representation, to effect an adjustment of her claims and protect her interests as well as the interests of purchasers under her. At this time, however, such necessity does not appear to exist. Most cases of conflict have been settled, the claims of the State have generally been adjusted in a satisfactory manner, and the object of the Act seems to have been accomplished. Business of the State before the United States departments meets with attention in due course, without personal exertion on behalf of the agent of the State. I am, therefore, of the opinion that legislation should be had upon this subject, with a view to the discontinuance of this State agency; especially so, as the law, as it now stands, entails an expense of two and one half cents per acre upon each purchaser of lands which are procured to be listed to the State. There may, of course, cases of conflict arise that would require more thorough attention than could consistently be expected from the officers of the United States departments, but, in such emergencies, the power to employ a special attorney would obviate the difficulty, without subjecting purchasers, whose lands were not in any manner involved in conflict, to the payment of the expenses of the contests of their less fortunate neighbors.

DELINQUENT PURCHASERS.

I would also call your attention to the existing laws governing the collection of delinquent interest upon sales of lands heretofore made by the State, and the annulment of title issued by the State, for reason of such delinquency. In this connection, I can but endeavor to show the effect of the present mode of procedure, without remarking upon its cause, or making suggestions of amendment, for the reason that the question of foreclosing, or annulling title already vested, on account of the neglect of the grantee to perform the conditions upon which he holds such title, has been, and still is, one that claims the attention of the highest legal and judicial ability. I am required each year to furnish to the District Attorney of each county in the State, a list of delinquents, as shown by the records of my office, without being allowed any discretion in cases of error or conflict. The annulments are subsequently had thereunder, and the School Fund forced to bear the expenses of all the necessary proceedings. After this, in every instance where the title of the State has failed, foreclosed purchasers ask for a return of all moneys paid by them on account of their purchase, and under the existing laws, and in equity, it cannot be refused to them. The State was the party in error, in issuing title for lands that did not belong to her, and when the failure of her title is established the purchaser from her must be reimbursed. Many annulments of certificates of purchase have been had during my term of office, and a heavy tax has been imposed upon the School Land Fund by reason thereof; still, it is a fact worthy of comment, that in almost every instance where these proceedings upon annulment have been reviewed by the Courts, the decrees of annulment have been set aside. This fact alone is sufficient commentary upon the existing regulations concerning this question, and demonstrates fully the imperative necessity of judicious legislation tending to the perfection of a system that will both enforce the payment of interest on sales of State lands, and (in cases of non-payment), afford a more effective and less expensive mode of procedure, and give finality to

decrees of foreclosure when had. For the future, I am strongly inclined to the opinion that the best policy for the State to pursue, would be to sell her lands for cash, payable within fifty days from the date of approval of applications. My reasons for advocating this policy are numerous, and appear to me to be conclusive. The State has sold most of the surveyed lands belonging to her—the principal unsold lands being situated in the extreme northern portion of the State, and east of the Sierra Nevada mountains, in the southeastern portion. These unsold lands are valuable only for grazing purposes. One of the objects of the sale by the State of its lands, on an indefinite credit, was to encourage immigration and actual settlement; but this policy, when applied to the lands now remaining unsold, is without effect, for the reason that such lands, in most instances, are not adapted to agricultural purposes, offer no inducements to settlers, and give very little encouragement to immigration. The very small portion of unsold territory that is adapted to such use is already in possession of settlers, who are ready and willing to purchase as soon as it is surveyed. In fact, the settler in California is, at this day, always ahead of the surveyors, and when the land he is in occupation of is in a condition to be sold, he can obtain the amount necessary to make his purchase on as good terms from others as will be given him by the State. It may be argued that the moneys received from the sales of State lands cannot be invested in any manner that will prove as lucrative as the present credit system. Still, I am of the opinion, that this objection will fail when the expenses of the proceedings for the collection of delinquent interest, and of suits for foreclosure, are taken into consideration. The United States sells her lands for cash, and other States who have abandoned the system of credit sales and adopted the same policy, are satisfied with the results.

SWAMP AND OVERFLOWED LANDS.

Since the commencement of my term of office, on December fourth, eighteen hundred and seventy-one, and up to August first, eighteen hundred and seventy-three, there have been sold swamp and overflowed lands as follows:

County.	Acres.
Butte	132.60
Colusa	1,737.73
Contra Costa	2,467.57
Del Norte	109.20
Fresno	7,221.91
Humboldt	637.51
Kern	41,966.32
Sierra	480.00
Plumas	4,703.94
Marin	407.01
Merced	2,159.87
Lassen	3,240.00
Monterey	470.89
Mendocino	120.00

SWAMP AND OVERFLOWED LANDS—Continued.

County.	Acres.
Napa	2,973.
Sacramento	561.
Siskiyou	1,796.
San Mateo	160.
San Joaquin	1,759.
Tulare	43,609.
Shasta	12,720.
Solano	550.
Sonoma	13,488.
Sutter	1,751.
Stanislaus	102.
Santa Clara	193.
Yolo	5,539.
Tehama	1,000.
Total acres	152,062.

The conflicting claims of the State and the United States, for the past ten years, have rendered uncertain the title to a large amount of land sold by the State as swamp and overflowed. During the year eighteen hundred and sixty-one, the State authorities, in pursuance of an Act of the Legislature, caused a segregation survey to be made, and maps prepared, showing the swamp and overflowed lands in cases where the United States Surveyors had not established the segregation lines to the satisfaction of the State. On December fifth, eighteen hundred and seventy-one, the Honorable Secretary of the Interior rendered a decision to the effect that, in all townships surveyed prior to July, eighteen hundred and sixty-six, the State is entitled to the land she had segregated as swamp and overflowed, and the United States Surveyor General was directed to construct and approve township plats conforming to the State segregation maps, when the same were in accordance with the rectangular system adopted in the United States surveys.

Under this decision, lists were prepared of said lands and forwarded to the United States Surveyor General for his action thereupon; and if the intent of this ruling of the Department of the Interior is carried out, the claim of the State to these lands will be fully substantiated, and all matters of conflict relating thereto definitely settled.

During my term of office, many other decisions have been made concerning this class of land, of greater or less importance; all, however, tending to an adjustment of conflicts between the State and the United States, or between parties claiming under the State that have long incumbered the records of this office, and operated as a cloud upon the title to these lands. During the same period there have been received, and are on file, surveys for about one hundred and fifty thousand acres of swamp lands, which have not been approved. The delay in the approval of these surveys arises from various causes. The Government surveys, made within the last few years, have disclosed the fact that there are large tracts of swamp lands in the valleys near the summit of the Sierra Nevada range of mountains, of which the State had before no official knowledge. A considerable portion of these lands had been claimed and occupied for years for grazing purposes, yet the occupants could obtain no title to the same. In eighteen hundred and seventy, the Legislature passed an Act making such settlers preferred purchasers of the lands thus occupied, until the expiration of ninety days from the date of the filing of the official township plat, showing such lands in the local United States Land Office. On making application to the United States Registers for the date of the filing of these plats, I was informed, in many instances, that they had not been received. On applying to the United States Surveyor General to ascertain the cause, I was informed that the want of sufficient clerical force in his office had caused the delay in preparing the copies for the several Land Offices. Surveys for a large amount of land, which the State had previously sold, have been received—the resurvey having been made by the second party, apparently on the hypothesis that the original sale was illegal. There are also many conflicts caused by two or more surveys having been made for the same tract. In such cases, an appeal to the Courts is generally necessary to determine the rights of the contestants. A large area of land has also been surveyed and returned to this office as swamp and overflowed, which is not shown to be such either by State segregations or by the United States maps.

RECLAMATION OF SWAMP AND OVERFLOWED LANDS.

The past two years has witnessed much activity in the prosecution of the work of reclaiming the swamp and overflowed lands of this State. Attention having been called to improvements of this character, as well on account of the satisfactory results in many instances attained, as of the judicious legislation had upon the subject during the last legislative session. The spirit of the Act of Congress, granting to the State this class of land, is, that they be received by her as a trust; the lands to be sold by the State, and the proceeds of the sale devoted to the reclamation of the lands sold. State legislation regarding them is, therefore, necessarily confined to the arrangement of details for the fulfillment of this trust. The State realizing nothing directly from the sales made, but anticipating results that will add to her taxable property hundreds of thousands of acres of land of the most fertile character, the subject of reclamation becomes of vital importance, especially when it is taken into consideration that these lands, when successfully reclaimed, become at once the garden spots of California. The greater portion of them, from their location along the banks of navigable rivers and sloughs, are easy of access, and offer to those willing to undertake the work of reclamation, prospects of future remuneration which will justify any reasonable expenditure of labor. Before the passage of the Act of eighteen hundred and sixty-eight, regulating the organization of reclamation districts, and the details of procedure under such organizations, no records were kept in my office of matters relating to works of reclamation; such proceedings having been had in the first instance before the State Board of Swamp Land Commissioners, and thereafter before the several County Boards of Supervisors. I can, therefore, give no reliable statistics as to the organization of reclamation districts which were organized before the passage of said Act. The Act in question requires, however, that all such organizations be at once reported to this office, and I am thus enabled to enumerate the districts organized thereunder.

The total number of districts so organized prior to August first, eighteen hundred and seventy-three, is one hundred and nine (109), of which sixty-nine (69) were reported to this office previous to the commencement of my term of office, on December fourth, eighteen hundred and seventy-one, and are numbered and located as follows:

No.	County.	No.	County.
61	San Joaquin	101	Contra Costa
67	Colusa	102	Contra Costa
68	Sutter	103	Contra Costa
69	Sutter	104	Solano
70	Sutter	105	Solano
71	Sacramento	106	Contra Costa
72	San Joaquin	107	Contra Costa
73	Sacramento	108	Yolo
74	Sacramento	109	San Joaquin
75	Sacramento	110	San Joaquin
76	Sacramento	111	Kern
77	Colusa	112	Contra Costa
78	Tulare	113	Merced
79	Fresno	114	Marin
80	Fresno	115	Colusa
81	Tulare	116	Kern
82	Alameda	117	Sacramento
83	San Joaquin	118	Contra Costa
84	Solano	119	Lassen
85	San Joaquin	120	Kern
86	Merced	121	Kern
87	Colusa	122	Merced
88	Fresno	123	Solano
89	Sacramento	124	Colusa
90	Colusa	125	Fresno
91	Colusa	126	Solano
92	Colusa	127	Solano
93	Colusa	128	Colusa
94	Colusa	129	Sacramento
95	Santa Clara	130	San Joaquin
96	Lake	131	Merced
97	Lake	132	Merced
98	Fresno	133	Fresno
99	Contra Costa	134	Napa
100	Contra Costa		

The remaining forty (40) of these districts have been reported to me since December fourth, eighteen hundred and seventy-one, and are numbered and located as follows:

No.	County.	No.	County.
41	Solano	150	Yolo
53	San Joaquin	151	Contra Costa
57	San Joaquin	152	Tulare
63	San Joaquin	153	Tulare
72	San Joaquin	154	Tulare
135	Tulare	155	Tulare
136	Sacramento	156	Tulare
137	Solano	157	San Joaquin
138	Contra Costa	158	Tulare
139	Merced	159	Tulare
140	San Joaquin	160	Contra Costa
141	Yolo	161	Contra Costa
142	Sacramento	162	San Joaquin
143	San Diego	163	San Joaquin
144	San Joaquin	164	Contra Costa
145	Solano	165	Contra Costa
146	Yolo	166	Contra Costa
147	Yolo	167	Tulare
148	Sacramento	168	Tulare
149	Sacramento	169	San Joaquin

The last Legislature, having in view the importance of the work of reclaiming this class of land, as tending towards the development of the resources of the State, directed its attention with much earnestness towards the inauguration of measures that would most speedily confer upon the State the benefits that must accrue from a thorough and systematic reclamation, and at the same time hold out to purchasers thereof inducements sufficient to warrant them in undertaking works of such magnitude.

On the part of the State, the difficulty to be met, was in arriving at details of procedure that would carry out, both in spirit and letter, the Act of Congress donating these lands; that is, the direct application of the purchase money to the reclamation of the lands. The tract books of my office were filled with the records of unconsummated sales, and, although reclamation, in many instances, was complete, there was no practical mode provided by which the State could issue title and give finality to her sales. On the part of purchasers, the great obstacle was the lack of capital with which to prosecute plans of reclamation. The majority of purchasers were laboring under a very onerous burden in the payment of assessments for this purpose, and were without means to pay the State in full for their lands. The lands themselves could not be hypothecated until they were patented by the State; and the State could not issue patents until payment in full was made. With these facts in view, the result of legislative deliberation was the passage of the Act of March thirtieth, eighteen hundred and seventy-two, creating the Board of Reclamation Fund Commissioners, and authorizing the issuance and sale of bonds, the proceeds of which were to be applied to reclamation purposes; and the Act of March sixteenth, eighteen hundred and seventy-two, which provides that upon proof being made that two dollars per acre in gold coin had been expended in works of reclamation, the purchaser should be credited with payment in full for his lands, and all moneys paid on account of the purchase thereof be refunded to him.

These two Acts, therefore, each presented a means by which the difficulties before recited might be surmounted; and their provisions were thoroughly canvassed throughout the State, with a view of deciding which of the means presented afforded to the purchaser the most immediate and effective relief. The Act creating the Board of Reclamation Fund Commissioners, on account of its cumbersome machinery, its multiplicity of detail, and the great expense attending its operation, has met with much disfavor, owners of land being disinclined either to impose upon their lands an incumbrance that would exist for a long term of years, or subject themselves to the payment of the expenses of the Board of Commissioners. This Act has therefore been as a dead letter, and although with certain alterations and amendments, it is capable of becoming of practical benefit, in its present shape, and with its present conditions, it is unwieldy and impracticable, and as such has been generally repudiated, land owners throughout the State having persistently refused to proceed under its provisions.

On the other hand, the Act of March sixteenth, before referred to, has proved itself to be both practical and available, and has been of incalculable value in overcoming the difficulties with which both the sale and reclamation of these lands have been surrounded. Under its provisions, the owners of lands, after expending two dollars per acre for reclamation purposes, or upon completion of reclamation, receive credit for the payment in full of the purchase price of their lands, and a return of the moneys theretofore paid by them on account of its purchase, either as principal or interest. They then receive patents for their lands, and their title being perfected, are enabled to obtain money for the uses of reclamation on reasonable terms, and for such period of time as may best suit each individual owner. The most convincing evidence of the efficiency of this Act, and its adaptation to the purpose for which it was intended, is the favor with which it has been met, and the avidity with which land owners have availed themselves of its provisions.

Thirty-one reclamation districts have presented to my office certificates as to condition of reclamation, as required by said Act, and have received the benefit thereof. The lands in these districts have (with few exceptions) been patented by the State to the purchasers, and the State consequently relieved of further care and responsibility on account thereof.

Twenty-five of these districts have received the benefits of said Act by virtue of the expenditure of two dollars per acre; and I beg leave to call your attention to the following tables, showing the location and

area of such districts, and the amounts refunded to purchasers of lands therein:

No. of District.	County.	Area.	Amount refunded to purchasers.	Remarks.
53	San Joaquin	8,738.38	$2,534 85	
57	San Joaquin	3,803.20	3,325 14	................Venice Island.
63	San Joaquin	1,920.00	2,071 76	
130	San Joaquin	5,000.00	4,411 20	..........Mandeville Island.
140	San Joaquin	193.50	191 05	
157	San Joaquin	3,922.71	1,506 75	
163	San Joaquin	1,628.51	1,206 42	..Rough and Ready Island.
71	Sacramento	6,500.00	9,871 38	
73	Sacramento	174.64	118 65	
74	Sacramento	525.00	519 83	
76	Sacramento	1,967.39	1,319 91	
89	Sacramento	1,123.00	1,870 05	
117	Sacramento	3,608.56	2,259 89	............Twitchell Island.
129	Sacramento	670.00	702 38	
148	Sacramento	8,233.00	5,273 97	
105	Solano	12,056.86	2,478 90	...............Grizzly Island.
126	Solano	994.96	246 47	
137	Solano	3,528.25	1,270 02	
70	Sutter	13,000.00	4,831 28	
107	Contra Costa	21,000.00	8,821 15	
118	Contra Costa and Alameda	11,440.00	6,001 83	
124	Colusa	20,060.00	3,071 27	
108	Colusa and Yolo	74,085.87	18,890 52	
101	Contra Costa	2,594.00	....	........Order not yet issued.
165	Contra Costa	321.07	....	........Order not yet issued.

The remaining six districts have received the benefit of said Act by virtue of complete reclamation, and are as follows:

No. of District.	County.	Area.	Amount refunded to purchasers.
93	Colusa	23,440.00	$5,631 30
81	Tulare	9,200.00	9,684 46
154	Tulare	1,120.00	681 35
156	Tulare and Fresno	2,360.00	666 29
135	Tulare and Fresno	1,194.37	1,222 34
88	Tulare and Fresno	12,740.00	16,683 51

The total number of acres embraced in these thirty-one districts being two hundred and fifty-seven thousand one hundred and forty-three and twenty-seven one hundredths ($257{,}143\frac{27}{100}$). The total amount of orders for repayment of purchase money, issued by me to the several County Treasurers, is one hundred and seventeen thousand three hundred and sixty-three dollars and ninety-two cents ($117,363 92), exclusive of the orders for Districts Numbers One Hundred and One and One Hundred and Sixty-five, of Contra Costa County, which are not yet prepared. This amount being apportioned among the several counties as follows:

Counties.	Amounts.
San Joaquin	$15,247 17
Sacramento	21,936 06
Solano	3,995 39
Sutter	4,831 28
Contra Costa	14,669 66
Alameda	153 32
Colusa	18,731 18
Yolo	8,861 91
Tulare	14,087 67
Fresno	14,850 28
Total	$117,363 92

In addition to these figures, I am creditably informed that District Number Five, of Sutter County, containing about one hundred thousand acres, is ready, and will, during the month of August, present to this office its certificate of the expenditure of two dollars per acre. In this district, the order for the return of purchase money will be the largest yet drawn, and will amount to about thirty-two thousand dollars. Districts "One Hundred and Sixty-four," of Contra Costa County, "Ten," of Solano County, and "Three," of Sacramento County, containing an aggregate of about twenty thousand acres, will also very shortly make like application.

From the foregoing statistics, it will be observed that the reclamation districts situated in the more southern portion of the State, have generally, in the instances cited, completed their work of reclamation, while the districts in the central portion of the State show only an expenditure of a specified sum per acre, and in but one instance (that of District Number Ninety-three, of Colusa County) is the fact of complete reclamation disclosed. This is easily accounted for by natural local causes. The southern portion of the State has no large watercourses intersecting it, and the annual overflow is necessarily very much less and much more easily guarded against than in the territory watered by the Sacramento, American, and Feather Rivers. In many instances, in the more southern counties, an expenditure of the sum of two dollars per acre would be more than adequate to effect a reclamation complete and thorough, while the same amount per acre expended upon a district situated in the valley of the Sacramento, would represent but a small fraction of the necessary cost of reclamation.

TIDE LANDS.

From December fourth, eighteen hundred and seventy-one, to August first, eighteen hundred and seventy-three, there have been tide lands sold as follows:

County.	Acres.
Humboldt	1,224.46
Marin	559.45
Solano	3,947.51
Contra Costa	54.66
Sonoma	718.51
San Luis Obispo	11.05
Total	6,515.64

At its April term, eighteen hundred and seventy-three, the Supreme Court of this State, in the case of *Kimball* v. *Macpherson*, decided that the shore of the ocean, between high and low tide, is not subject to sale by the State, under the laws providing for the sale of tide lands.

Quite a number of surveys, embracing lands of this class, were, at the time of said decision, on file in my office, which I had previously declined to approve. In some cases, long, narrow strips were surveyed by the owners of the adjacent high lands, to protect themselves, but often these surveys were made in the interest of parties who did not own any high land in the vicinity, evidently with the view of obtaining control of the water front. After said decision, I rejected all unapproved tide land surveys of this class, and returned them to the County Surveyors from whom they were received.

I am of the opinion that in any future legislation on the subject of tide lands, the ocean beach should be expressly reserved from sale.

COUNTY BOUNDARIES.

On March first, eighteen hundred and seventy-two, the Legislature passed an Act requiring the Surveyor General to survey and establish that portion of the southern boundary of Siskiyou County which forms the northern boundary of Shasta and Lassen Counties. I deputed Wm. Minto, Esq., to make the survey, and issued to him instructions as to the manner of establishing the line. The survey was made, and the map and field notes of the same were duly returned to this office, and approved by me on July thirteenth, eighteen hundred and seventy-two. This is the only county boundary line established by authority of this office during my term.

GENERAL OFFICE BUSINESS.

During my term, the business of this office has been unusually large. The large number of approvals made, and the many contests that have been determined, have necessarily been followed by a correspondingly large issuance of title. The delinquent list for the year eighteen hundred and seventy-two occupied, in its preparation, much time, and the most careful attention, from the fact that my predecessor had not prepared any complete list during the last two years of his administration. The tract books of the Register's department, owing to their defective construction, and to long and constant use, had become much disfigured and mutilated. These tract books consist of eleven large volumes of written matter; and their contents, exhibiting, as they do, the title to all the lands sold by the State, are of incalculable value. To preserve these records, I have, therefore, caused new and more substantial books to be prepared, and have commenced the labor of rewriting them in full. The Act of March sixteenth, eighteen hundred and seventy-two (herebefore referred to in this report), concerning the reclamation of swamp and overflowed lands, have caused the issue of a very large number of patents, as well as protracted and exhaustive investigation as to the organization of each reclamation district seeking the benefit of said Act, and careful computation of the amounts paid in each district on account of the purchase of lands. I have also received over ten thousand business letters and communications, relating to transactions had in my office, and it being my policy to furnish to every inquirer all information within my power to give, these letters and communications have all been answered in full and with dispatch. The pressure occasioned by these and various other causes has necessitated the continuous employment of a large clerical force in both departments of my office; and to prevent an accumulation of business, with its consequent confusion and annoyance to parties having business to transact relative to State lands, I have been compelled to employ much extra assistance. I have, during my term of office, and prior to August first, eighteen hundred and seventy-three, received as fees, the sum of twenty-eight thousand five hundred and ninety-three dollars and twenty-eight cents. Of this amount I have paid to the Secretary of State his fees upon patents, amounting to two thousand eight hundred and ninety-eight dollars. I have also paid out for maps, records, documents, and extra assistance, the sum of eleven thousand and forty-nine dollars and eighty-four cents. Leaving a balance on hand of fourteen thousand six hundred and forty-five dollars and forty-four cents, which amount I have paid into the State Treaaury.

RESOURCES OF CALIFORNIA.

In conclusion of this report, I present for your consideration a table of statistics, compiled by me from the reports of the Assessors of the several counties, exhibiting the industries and productions of California. These statistics are not fully complete, for the reason that I have not as yet received reports for eighteen hundred and seventy-three from the Counties of Mariposa, Mendocino, Tehama, and the new County of Ventura, which fact, while it may materially decrease the totals of the State at large, will not materially affect the comparative exhibits as between counties. These reports of County Assessors are the only data provided as the basis of my report in this connection, and perhaps no other system would be more adaptable to the collection of such information. Still, I am positively of the opinion that the showing made in this report, and as previously made in the reports of my predecessors, does not exhibit results which do full justice to the claims of California. The details of these statistics being furnished by property owners to the Assessor of his county, are too generally placed at the lowest possible estimate, and given with the greatest reluctance, fearing their use as a basis of assessment for purposes of taxation.

The resources of the State of California are perhaps more varied than those of any other of the States of the Union. Its very large area, its geographical position, and the high elevations of its mountain ranges, bestow upon it climatic advantages of the highest order. In the extreme northern portion of the State the temperature is never so low as to necessitate the precautions and inconveniences to which the Middle States of the Eastern Slope are subjected; neither is the most southern portion of so high a temperature as to propagate either the malaria of a tropical country or the lassitude and indolence of its inhabitants. Ever swept through her whole length and breadth by moderate winds, fresh from the bosom of the Pacific Ocean, the extremes of heat and cold are unknown to California.

The soil of California is as prolific in its character as it is varied in its adaptations, producing with equal facility the vines of continental Europe, the hardier cereals of northern America, and the luxuriant fruits and flowers incident to the tropics. Her mountain hills and streams are the depositories of gold, silver, and valuable minerals, in quantities that have attracted the attention of the civilized world. Her inhabitants are the representatives of every nation on the face of the globe; an enterprising, active people, that have, in a few years, erected a prosperous State upon the most remote borders of civilization.

With these natural advantages of soil, climate, and mineral deposit, no uncertainty as to the future of California can reasonably be entertained. Her population is steadily increasing; her resources are each year being more completely developed; her immense area offers every inducement to immigration, and, judged by the American standard of progress, she is destined not only to maintain her past proud position amongst her sister States, but to attain a preëminence that shall be as enviable as it is deserved.

As shown by the statistics, thirteen million eight hundred and forty-three thousand two hundred and forty bushels of wheat were produced during the year A. D. eighteen hundred and seventy-one, and twenty-six million eighty-nine thousand six hundred and sixty-seven bushels during the year A. D. eighteen hundred and seventy-two. This result, taken as correct, compares very favorably with the production of other States, while at the same time a comparison of the number of acres cultivated with the yield in bushels, does not correctly show the average per acre, either as a general average, or as applied to any individual county, for the reason that a very considerable portion of this crop is in California diverted from the uses to which in other localities it is invariably devoted; a very large amount thereof being cut for hay, and much never cut at all, but used on the ground from which it is raised, for the fattening of hogs. These causes, together with the low figures usually furnished to the Assessors, will warrant that the average yield per acre is very much larger than can be exhibited by this report. The Counties of Sonoma, Santa Clara, Monterey, Butte, and Stanislaus, stand at the head of the grain-producing counties for the year eighteen hundred and seventy-one; and the Counties of Stanislaus, Colusa, San Joaquin, Monterey, and Contra Costa, for the year eighteen hundred and seventy-two. Together with this yield of wheat, a large quantity of barley has been raised, which, in this State, is extensively used as a substitute for the corn and oats of the Eastern States. The wheat of California has attained a world-wide celebrity; it commands always the highest market price, and, as a crop, it is highly remunerative. Much of it is raised for the markets of Europe, and the shipping advantages and yearly increasing foreign demand, is causing this crop each year to become more and more the leading interest of the Pacific Coast. Grain of many other descriptions is raised for home consumption, and the supply of the several varieties is limited only by the demand.

The fruit products of this State are, perhaps, of greater variety than those exhibited by any other branch of agriculture, and, in their variety, are more characteristic of the peculiarities of California climate and soil, than any of the many evidences that have yet attracted public attention. All the fruits of the temperate zone are produced in profusion, and attain an unusual size and flavor. In the more southern counties many fruits incident to tropical climates are produced with profit and in abundance. Oranges, lemons, figs, pomegranates, limes, and olives, are yearly figuring more extensively among California productions. The fruits of this State are demanded by the epicures of the East, and are shipped in large quantities to all parts of the Union.

The mountains of the Coast Range and of the Sierra Nevadas are covered with almost virgin forests, embracing valuable timber of endless variety, the Coast Range producing an unlimited amount of the redwood timber peculiar to that locality, and so truly valuable for its self-preserving qualities, as well as the laurel, now so extensively used for various ornamental purposes. The large growth of redwood timber, as well as laurel, is principally confined to the Counties of Humboldt, Mendocino, San Mateo, and Santa Cruz. Millions upon millions of feet of redwood lumber are each year cut in these counties for the supply of home demand, and for shipment to South American and Mexican ports, as well as to the islands of the Pacific Ocean. The pine, spruce, and fir, of the Sierra Nevada range, supply the large demand for home consumption, as well as for the large extent of untimbered territory lying along our eastern boundary.

Cattle and sheep raising have become thoroughly identified with the interests of California. The even temperature of climate at once does away with the most serious obstacles incident to this branch of industry in the other Northern and Middle States. The Winters are of such a nature that neither cattle nor sheep require protection from the inclemency of the weather; good feed is found during all the months of the year; even in the driest periods of our long Summers, the grass, that to all appearances is withered and unfit for consumption, contains all the nutritious qualities of well cured hay, while upon the first rains of Winter the pasture is at once covered with grass to supply the needs of the succeeding year. Much attention has been of late paid to the improvement of the breeds of cattle, and whereas, but a few years since the country was filled with cattle of inferior size and quality, driven here in times of high prices from the plains of Texas and Mexico, it has now become the home of the descendants of the most valued domestic and imported breeds. The same follows with sheep and goats. The wool clip is annually becoming larger and of a better quality. Sheep in California are sheared twice during the year, and the product at all times commands remunerative prices. Range for these animals is plenty, and sheep and wool growing in California has given it no small share of its celebrity. This may principally be attributed to the same climatic causes that offer such inducements in the raising of cattle. By sheep raisers here, it is calculated that the flock will more than double itself in number each year, and that the returns from sales of wool will be in excess of all expenses incurred, thus leaving an annual profit of the total increase in number, amounting virtually to over one hundred per cent upon the amount invested in the purchase of the flock. The principal cattle-raising counties of the State are Monterey, San Luis Obispo, Siskiyou, Santa Clara, Sonoma, Kern, Fresno, and Humboldt, and the chief sheep-raising counties are Los Angeles, Santa Barbara, San Luis Obispo, Fresno, and Merced, the County of Marin far exceeding all other localities in the products of the dairy.

Wine making, as a general industry, is steadily pushing forward its claims to attention. Each year proves the climate and soil of California to be better adapted to the culture of the grape. Vines grow upon the hills, and in the valleys, bearing an abundance of fruit of every conceivable variety. California wines are in constant demand in Eastern markets, and are yearly advancing in universal favor. The principal wine-producing counties are Los Angeles, Sonoma, Napa, Sacramento, and El Dorado.

Humboldt County, in the year A. D. eighteen hunered and seventy-two, produced twenty-one thousand four hundred and eighty tons of potatoes. San Mateo and Sonoma Counties come next; San Mateo raising during said year, eight thousand two hundred and forty-two tons, and Sonoma, seven thousand eight hundred and forty tons.

The deductions that I have drawn from the reports of statistics are necessarily few and inadequate, but a careful examination of the figures presented in the following tables, will present information of a valuable order, and establish results highly eulogistic of the capabilities of our State for all the general purposes of agriculture, stock raising, and the hundred other branches of industry that shall tend to make her a great State among great States. The inducements held out by her for immigration from the over-crowded countries of Europe, and of the Eastern States, are many and of great force. Here there is room for all. To the thrifty husbandman, looking about him for some spot where he with his small means may build for himself a home, and make provision for his declining years, our State extends a welcome most hearty. To the wealthy, who seek a land where they may fully enjoy the fruits of their former labors, we offer a climate unsurpassed; scenery, the most varied and romantic; society, both cultivated and refined. To the manufacturer, we say that every stream within our State which flows from the mountain ranges to the Pacific Ocean, abounds with water powers, and every requirement for the enterprises in which he may desire to engage. Lands can be obtained at reasonable prices, both from the United States, the State, and from private parties. The extent of territory within the borders of California, gives promise that there is room for all, and the State of California cannot, and will not, in the pursuance of its past and present policy, fail to extend to every new comer a welcome as cordial as it is sincere, and a protection as complete as it is impartial.

TABLE OF STATISTICS.

Industrial and other statistical information for the year eighteen hundred and seventy-two, as reported to the Surveyor General by the several County Assessors, embracing the entire State.

COUNTIES.	Acres of land inclosed in 1871..........	Acres of land cultivated in 1871..........	WHEAT.		BARLEY.		Acres of land cultivated in 1872..........	Acres of wheat sown in 1872..	Acres of barley sown in 1872..
			Acres....	Bushels.	Acres....	Bushels.			
Alameda	94,790	124,546	70,408	429,543	26,667	204,580	115,408	67,837	17,965
Alpine	20,000	2,050	40	800	100	2,600	2,050	50	100
Amador	61,570	18,090	1,740	33,640	2,190	43,306	17,170	2,130	3,150
Butte	171,061	83,606	46,636	932,720	16,041	449,138	83,606	46,636	16,041
Calaveras	28,742	10,656	683	7,245	1,965	34,536	11,200	730	2,040
Colusa	100,000	80,000	....	....	....	....	125,000	100,000	20,000
Contra Costa......	125,940	69,790	51,140	701,790	15,400	310,030	70,820	51,900	16,100
Del Norte..........	10,650	2,135	276	5,960	304	17,200	1,448	220	280
El Dorado..........	41,252	10,447	747	5,224	321	3,089	10,547	9,424	920
Fresno..........	80,423	23,716	6,843	34,119	5,415	45,809	20,000	10,540	9,736
Humboldt..........	47,684	14,240	1,265	31,875	650	2,600	15,160	1,510	582
Inyo	....	4,500	750	22,500	975	29,250	6,443	1,080	2,520
Kern	18,249	13,595	2,409	500	3,275	800	18,000	5,000	4,000
Klamath	....	....	....	....	....	....	....	....	....
Lake	29,911	7,508	3,868	85,612	2,379	64,060	7,386	3,800	2,620
Lassen	24,855	4,682	1,191	18,255	2,066	34,313	5,100	1,520	2,100
Los Angeles	45,300	44,800	500	10,500	11,500	339,200	49,000	500	11,800
Marin	270,000	33,000	2,200	44,000	6,223	199,136	65,000	2,200	6,223
Mariposa..........	26,100	6,900	950	7,000	2,500	6,500	6,900	950	2,500
Mendocino..........	133,000	40,000	6,000	90,000	2,200	88,000	42,000	7,000	2,000
Merced	250,000	200,000	150,000	750,000	50,000	100,000	300,000	200,000	75,000
Mono	5,960	695	219	2,735	286	4,765	772	310	290
Monterey..........	237,890	117,075	54,210	1,082,200	48,378	809,900	233,100	155,700	65,200
Napa	107,650	40,620	32,530	585,540	3,725	98,790	48,000	31,500	3,950
Nevada..........	60,000	10,000	....	....	....	....	10,000	....	....
Placer	51,308	31,673	14,473	191,568	4,468	73,029	43,564	16,040	4,390
Plumas	55,800	9,250	900	9,000	1,200	15,000	11,000	1,080	1,440
Sacramento	288,370	68,169	11,797	198,603	26,653	419,954	62,016	8,506	25,928
San Bernardino...	21,776	5,543	1,115	13,557	1,850	20,055	8,989	2,417	3,757
San Diego	8,490	6,094	1,713	10,244	2,700	16,916	12,640	1,804	7,246
San Francisco ...	....	....	....	....	....	....	....	....	....
San Joaquin	275,000	120,000	80,000	640,000	20,000	225,000	225,000	186,125	29,375
San Luis Obispo..	100,000	15,000	2,000	30,000	10,000	300,000	20,000	3,000	12,000
San Mateo	150,000	100,000	25,000	250,000	27,000	810,000	87,000	35,000	25,000
Santa Barbara....	26,720	25,050	970	22,465	10,210	92,560	56,700	9,072	28,600
Santa Clara..........	499,406	194,359	120,936	1,255,287	17,529	113,931	164,090	142,573	12,444
Santa Cruz	68,370	16,279	6,222	167,084	2,722	118,151	18,496	8,189	4,232
Shasta	56,048	30,320	7,728	101,712	6,952	145,396	31,350	7,672	7,640
Sierra	56,528	2,980	1,120	15,680	900	19,180	3,200	1,200	1,060
Siskiyou..........	74,732	30,017	7 992	142,926	1,972	51,442	30,000	7,992	1,200
Solano	114,081	65,737	60,448	228,296	14,825	49,480	475,647	340,191	10,958
Sonoma	500,000	312,800	165,200	2,760,350	15,340	324,989	208,937	102,352	14,896
Stanislaus..........	80,000	350,000	290,000	900,000	60,000	225,000	400,000	340,000	50,000
Sutter..........	223,784	....	92,267	482,335	20.275	101,375	120,830	60,060	12,120
Tehama	246,744	46,920	23,606	542,938	11,000	275,000	120,000	60,000	45,000
Trinity..........	10,440	6,544	1,280	12,770	125	2,550	6,530	1,175	90
Tulare..........	49,282	22,395	5,286	60,542	11,523	122,429	32,882	11,559	17,848
Tuolumne	141,986	40,000	5,000	80,000	1,000	10,000	40,000	5,000	1,000
Yolo..........	71,593	144,441	55,335	707,525	11,315	180,410	164,202	69,987	12,240
Yuba	110,000	52,000	11,000	138,600	12,375	201,800	46,000	13,240	8,900
Totals..........	5,261,485	2,658,222	1,425,993	13,843,240	494,494	6,801,249	3,653,183	2,134,771	602,481

TABLE OF STATISTICS—Continued.

COUNTIES.	OATS.		RYE.		CORN.		BUCKWHEAT.		PEAS.	
	Acres.......	Bushels....	Acres.......	Bushels....	Acres......	Bushels....	Acres.......	Bushels....	Acres.......	Bushels....
Alameda	1,570	29,947	23	300	935	23,485	49	787	150	2,925
Alpine	200	5,000	....	....	15	375	....	....	....	....
Amador	10	430	....	....	1,590	29,370	....	....	....	....
Butte	346	12,110	243	4,860	518	25,900	12	480	11	418
Calaveras	25	75	5	65	640	5,000	....	....	....	....
Colusa	....	....	....	....	125	4,000	....	....	....	....
Contra Costa	1,800	48,900	670	2,000	200	5,320	30	570	20	410
Del Norte	500	20,580	2	50	15	450	3	67	112	3,100
El Dorado	218	800	....	....	....	....	....	....	....	....
Fresno	49	571	87	924	850	1,763	16	120	....	....
Humboldt	3,750	187,500	17	680	290	10,150	2	60	1,287	70,800
Inyo	300	6,000	....	....	1,800	54,000	10	300	9	180
Kern	25	40	50	100	250	3,000	....	....	....	....
Klamath	....	....	....	....	....	....	....	....	....	....
Lake	151	5,458	10	200	130	3,210	....	....	....	....
Lassen	1,224	33,432	....	....	16	536	2	44	....	....
Los Angeles	Cut for hay. 370	200	140	3,920	11,100	521,000	65	1,500	80	2,000
Marin	13,117	393,510	....	....	....	....	....	....	....	....
Mariposa	400	....	50	200	70	850	....	....	5	150
Mendocino	6,300	200,000	50	1,500	200	6,000	....	....	....	....
Merced	....	....	....	....	500	15,000	....	....	....	....
Mono	190	3,635	....	....	....	....	....	....	....	....
Monterey	300	8,500	15	250	480	12,750	18	320	280	4,200
Napa	750	23,080	50	750	1,715	59,980	....	....	6	160
Nevada	....	....	....	....	50	2,000	....	....	....	....
Placer	5,538	....	252	3,172	61	1,728	....	....	....	....
Plumas	6,950	33,750	....	....	7	150	3	50	....	....
Sacramento	1,242	22,866	21	321	1,856	56,105	42	950	13	386
San Bernardino	26	750	....	....	796	18,880	....	....	....	....
San Diego	....	....	17	312	740	15,645	....	....	3	65
San Francisco	....	....	....	....	....	....	....	....	....	....
San Joaquin	25	600	450	5,400	750	1,800	4	75	8	280
San Luis Obispo	....	....	....	....	200	5,000	....	....	15	600
San Mateo	10,000	500,000	....	....	25	250	150	1,500	150	2,000
Santa Barbara	....	....	....	....	5,340	126,000	....	....	....	....
Santa Clara	625	10,216	215	2,183	125	5,620	....	....	2	40
Santa Cruz	2,217	73,053	129	2,760	1,008	18,631	26	600	....	....
Shasta	108	2,784	....	....	117	2,450	....	....	....	....
Sierra	560	11,800	20	310	....	....	....	....	....	....
Siskiyou	3,650	91,250	35	450	115	4,000	30	132	20	250
Solano	500	2,000	....	....	625	3,000	....	....	50	100
Sonoma	23,380	398,726	159	2,478	3,873	125,114	....	....	....	....
Stanislaus	....	....	....	....	400	12,000	....	....	....	....
Sutter	25	300	....	....	482	12,050	2	43	....	....
Tehama	400	12,000	....	....	120	12,000	....	....	10	400
Trinity	....	....	....	....	50	1,075	....	....	....	....
Tulare	130	1,784	139	1,770	857	15,035	....	....	....	....
Tuolumne	100	1,000	50	1,000	100	2,500	....	....	10	300
Yolo	....	....	....	....	60	1,200	....	....	17	2,400
Yuba	985	21,400	....	....	800	24,000	....	....	....	....
Totals	88,056	2,164,047	2,899	35,955	39,996	1,248,372	464	7,598	2,258	91,144

TABLE OF STATISTICS—Continued.

COUNTIES.	PEANUTS.		BEANS.		CASTOR BEANS.		POTATOES.		SWEET POTATOES.	
	Acres.........	Pounds......	Acres.........	Bushels......	Acres.........	Pounds......	Acres.........	Tons	Acres.........	Tons ....
Alameda			209	3,110			830	9,072		
Alpine			6	200			80	600		
Amador			3	170			290	2,940	7	95
Butte	19	57,000	16	640			44	132	23	138
Calaveras			130	6,000			250	750	3	3
Colusa			12	200			100	125	75	100
Contra Costa			225	4,560			90	422	6	30
Del Norte			5	50			144	594		
El Dorado							90	6,120		
Fresno			47	1,055			120	600	12	50
Humboldt			15	165			3,618	802,800		
Inyo			428	15,050			200	200		
Kern	10	1,000					100	50		
Klamath										
Lake							10	21		
Lassen			3	48			55	226		
Los Angeles	85	77,350	980	19,500	110	110,000	1,400	7,000	100	600
Marin							4,963	173,705		
Mariposa	1	12	10	300			60	2,700		
Mendocino							2,500	8,100		
Merced	30	45,000	100	5,000			200	480	50	150
Mono							26	77		
Monterey			820	31,500			1,980	4,068		
Napa			8	260			30	2,400		
Nevada							300	1,000		
Placer	11	3,721	10				250	45	34	4
Plumas							200	300		
Sacramento			309	8,907			1,912	7,563	322	1,359
San Bernardino			7½	269			37½	137	15	29
San Diego			28½	260			70	138		
San Francisco										
San Joaquin	1	275	20	450			135	156	2	2
San Luis Obispo			300	1,200			150	450		
San Mateo			500	5,000			4,260	4,420		
Santa Barbara	32	3,340	1,124	6,844			580	468	35	16
Santa Clara							175	3,132	3	15
Santa Cruz			45	780			584	1,856		
Shasta	2½	1,250	21	360			216	463	6	11
Sierra							98	270		
Siskiyou			40	600			310	279	2	3
Solano			30	300	20	4,000				
Sonoma	10	8,320	29	732			3,543	17,826	20	109
Stanislaus										
Sutter	½	305	125	3,825	130	100,000	77	186	87½	328⅛
Tehama	200	200,000	30	1,000			93	391	30	180
Trinity			15	450			160	467		
Tulare		75	12	173			81	231	15	45
Tuolumne			300	6,000			400	4,000		
Yolo	40	38,000	312	12,480			104	312	60	2,000
Yuba			30	1,000	505	428,800	120	375		
Totals	442	435,648	6,305	138,438	765	642,800	31,035	1,067,647	907½	5,267⅛

TABLE OF STATISTICS—Continued.

COUNTIES.	ONIONS.		HAY.		FLAX.		HOPS.		TOBACCO.		BEETS
	Acres.........	Bushels......	Acres.........	Tons..........	Acres.........	Pounds	Acres.........	Pounds	Acres.........	Pounds	Tons..........
Alameda	340	36,400	5,520	8,875	71	13,500	8	6,500	....	....	870
Alpine	....	....	1,000	1,000	....	....	....	....	....	....	25
Amador	....	....	4,800	4,443	....	....	11	4,793	....	....	60
Butte	27	8,100	13,650	14,604	....	....	....	....	1	3,000	51
Calaveras	80	3,200	4,786	4,289	....	....	....	....	....	....	....
Colusa	10	1,666	2,500	2,500	....	....	....	....	....	....	....
Contra Costa	28	3,810	13,700	14,300	....	....	....	....	....	....	1,400
Del Norte	1	40	705	1,560	....	....	....	....	....	....	5
El Dorado	....	....	3,769	1,252	....	....	....	....	....	....	....
Fresno	....	....	4,000	4,621	....	....	....	....	¼	50	45
Humboldt	3	300	3,030	6,340	....	....	....	....	....	....	315
Inyo	10	500	3,000	3,000	....	....	....	....	....	....	5
Kern	....	....	3,409	3,000	....	....	....	....	....	....	....
Klamath	....	....	....	....	....	....	....	....	....	....	....
Lake	....	....	3,043	4,071	....	....	....	....	....	....	....
Lassen	5	483	4,808	8,184	....	....	....	....	....	....	16
Los Angeles	80	28,500	2,500	6,250	2	....	35	52,500	55	27,500	150
Marin	....	....	6,897	8,121	....	....	....	....	....	....	....
Mariposa	10	700	7,000	13,000	....	....	....	....	....	....	7
Mendocino	....	....	10,000	12,000	....	....	60	56,000	....	....	....
Merced	10	2,000	2,000	8,000	....	....	15	45,000	....	....	[illegible]
Mono	....	....	3,180	4,102	....	....	....	....	....	....	....
Monterey	540	16,000	3,730	6,880	2,405	624,200	82	1,200	45	12,500	....
Napa	5	670	8,650	12,585	....	....	14	29,200	....	....	120
Nevada	....	....	9,000	4,500	....	....	....	....	....	....	....
Placer	1	....	5,905	8,328	....	....	....	....	....	....	3
Plumas	4	140	20,000	7,000	....	....	....	....	....	....	11
Sacramento	43	5,777	28,037	22,779	....	....	130	164,018	....	....	264
San Bernardino	4¾	1,574	863	1,813	....	....	....	....	....	....	206
San Diego	3	260	1,555	1,154	....	....	....	....	....	....	122
San Francisco	....	....	....	....	....	....	....	....	....	....	....
San Joaquin	8	1,200	15,000	12,000	....	....	12	6,500	....	....	35
San Luis Obispo	5	500	10,000	15,000	....	....	....	....	....	....	1,500
San Mateo	150	1,500	10,000	10,000	500	....	....	....	....	....	500
Santa Barbara	....	....	....	8,140	....	....	....	....	10	....	340
Santa Clara	63	7,500	20,165	35,489	5	....	87	44,000	....	....	535
Santa Cruz	....	....	1,962	3,670	1,304	1,414,500	60	21,200	....	....	450
Shasta	4	236	4,674	4,806	....	....	....	....	....	....	15
Sierra	12	640	9,720	10,140	....	....	....	....	....	....	....
Siskiyou	10	600	7,175	10,760	....	....	....	....	....	....	15
Solano	....	....	11,996	7,998	....	....	....	....	....	....	250
Sonoma	21	2,562	21,510	40,200	....	....	....	....	....	....	....
Stanislaus	....	....	....	....	....	....	....	....	....	....	....
Sutter	2	193	8,298	2,124	....	....	20	14,125	....	....	50
Tehama	15	5,130	4,381	7,381	....	....	....	....	....	....	7
Trinity	10	450	2,476	3,670	....	....	....	....	....	....	5
Tulare	3	105	2,463	2,371	....	....	....	....	....	....	7
Tuolumne	100	2,500	20,000	25,000	....	....	....	....	20	5,000	20
Yolo	20	3,760	7,010	7,760	....	....	....	....	....	....	200
Yuba	18	3,000	15,000	11,360	....	....	....	....	....	....	30
Totals	1,645¾	139,996	352,867	411,420	4,287	2,052,200	534	445,036	131¼	48,050	7,654

TABLE OF STATISTICS—Continued.

COUNTIES.	Tons of turnips	Tons of pumpkins and squashes	COTTON.		Pounds of silk cocoons	Acres of broom corn	Pounds of butter	Pounds of cheese	Pounds of wool	Pounds of honey
			Acres	Pounds						
Alameda	115	594	....	....	....	....	226,250	....	247,840	750
Alpine	30	30	....	....	....	....	50,000	....	....	....
Amador	30	83	....	....	....	21	3,110	1,160	72,300	1,140
Butte	42	1,648	....	....	....	....	15,325	....	255,872	14,900
Calaveras	6	24	....	....	3	....	5,000	....	202,779	3,945
Colusa	....	....	....	....	....	....	....	....	1,000,000	30,000
Contra Costa	700	2,000	....	....	....	....	194,200	38,900	110,620	6,200
Del Norte	48	4	....	....	....	....	58,760	23,980	3,185	1,670
El Dorado	....	....	....	....	....	....	1,060	700	1,100	423
Fresno	15	150	....	....	....	....	18,000	1,421	696,462	1,900
Humboldt	140	....	....	....	....	....	84,640	3,500	139,908	3,095
Inyo	5	10	....	....	....	....	5,000	....	2,000	500
Kern	....	20	....	....	....	....	1,000	500	25,000	....
Klamath	....	....	....	....	....	....	2,000	....	50	....
Lake	....	....	....	....	....	....	11,450	24,000	43,816	....
Lassen	4	12	....	....	....	....	50,505	13,000	15,360	140
Los Angeles	15	2,900	....	....	500	75	32,800	9,200	938,000	124,000
Marin	....	....	....	....	....	....	4,387,500	132,600	....	....
Mariposa	15	12	....	....	....	....	9,000	800	90,000	....
Mendocino	....	....	....	....	....	....	50,000	8,000	850,000	2,100
Merced	50	1,000	....	....	....	....	750	15,000	896,064	2,000
Mono	....	....	....	....	....	....	11,980	2,260	....	....
Monterey	28	450	....	....	....	....	158,500	1,282,300	542,600	93,000
Napa	40	330	....	....	90	6	145,000	7,350	51,610	3,750
Nevada	....	....	....	....	....	....	25,000	....	18,000	5,000
Placer	5	4	....	....	....	....	14,049	2,150	95,637	7,934
Plumas	25	20	....	....	....	....	140.000	4,000	7,000	500
Sacramento	112	1,823	....	....	....	345	214,863	62,570	325,177	4,635
San Bernardino	47	60	....	....	....	....	24,225	2,700	66,000	7,600
San Diego	34	149	....	....	....	....	5,640	2,000	80,000	22,350
San Francisco	....	....	....	....	....	....	....	....	....	....
San Joaquin	20	25	....	....	....	2	150,000	7,000	215,000	1,000
San Luis Obispo	25	300	....	....	....	....	14,060	53,150	224,724	1,000
San Mateo	20	20	....	....	50	....	70,000	140,000	2,600	....
Santa Barbara	26	1,560	....	....	....	....	....	18,400	708,275	9,100
Santa Clara	125	2,223	....	....	....	....	71,200	461,165	96,731	2,520
Santa Cruz	....	1,576	....	....	....	....	140,328	26,495	2,000	....
Shasta	18	24	....	....	....	....	13,275	....	109,852	5,510
Sierra	....	10	....	....	....	....	75,000	11,000	2,300	3.500
Siskiyou	30	75	....	....	....	5	78,500	17,250	83,900	6,817
Solano	20	25	....	....	....	10	32,375	700	28,299	2,000
Sonoma	358	6,172	....	....	....	....	762,400	356,207	272,925	1,750
Stanislaus	....	....	....	....	....	....	7,000	....	250,000	10,000
Sutter	4	387	....	....	25	338	27,089	....	129,498	698
Tehama	20	14	....	....	....	90	20,000	3,000	953,000	3,000
Trinity	2	15	....	....	....	....	19,325	800	400	700
Tulare	....	66	....	....	....	....	2,310	....	856,538	7,845
Tuolumne	30	20	....	....	....	....	100,000	....	10,000	5,000
Yolo	100	400	....	....	105,500	....	126,000	5,000	163,629	4,150
Yuba	20	300	....	....	....	25	80,000	3,000	95,000	1,800
Totals	2,324	24,535	....	....	106,168	917	7,734,469	2,741,198	10,481,042	403,922

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of apple trees	Number of peach trees	Number of pear trees	Number of plum trees	Number of cherry trees	Number of nectarine trees	Number of quince trees	Number of apricot trees
Alameda	50,514	13,570	16,164	11,858	28,519	3,300	1,468	3,427
Alpine	....	....	....	....	....	....	....	....
Amador	38,600	19,460	4,400	5,340	2,460	860	2,190	1,875
Butte	36,445	35,385	5,991	4,750	2,483	1,015	721	2,171
Calaveras	25,867	9,926	3,102	1,944	488	497	673	453
Colusa	30,000	50,000	4,000	3,000	1,200	1,000	....	1,500
Contra Costa	35,000	18,600	9,000	3,600	3,010	306	1,780	800
Del Norte	8,215	210	415	450	315	8	18	6
El Dorado	85,724	42,993	9,297	11,763	2,295	967	763	341
Fresno	2,013	3,329	576	423	108	123	121	226
Humboldt	59,682	780	1,275	2,380	1,456	....	126	55
Inyo	500	1,500	200	100	75	50	40	42
Kern	1,280	1,983	400	286	94	65	208	160
Klamath	1,262	481	85	56	12	....	....	....
Lake	9,178	4,531	1,368	1,354	245	50	28	110
Lassen	7,484	2,569	449	522	64	45	83	198
Los Angeles	7,100	11,400	5,200	200	150	400	1,100	1,900
Marin	33,290	513	343	472	265	....	197	35
Mariposa	6,500	7,500	1,050	525	200	120	150	450
Mendocino	15,000	6,700	900	400	250	300	150	200
Merced	3,000	4,000	1,000	500	200	300	200	400
Mono	....	....	....	....	....	....	....	....
Monterey	41,843	14,070	21,254	31,417	13,864	582	102	1,407
Napa	61,500	25,800	19,025	7,115	12,340	9,300	1,520	1,980
Nevada	28,274	9,076	5,074	1,800	993	185	481	59
Placer	49,198	24,519	11,720	3,152	7,973	1,176	2,078	725
Plumas	3,000	1,000	300	200	75	40	30	50
Sacramento	87,460	98,700	29,772	21,194	7,250	3,821	3,860	13,241
San Bernardino	9,652	10,905	978	1,009	69	152	309	1,265
San Diego	790	4,678	1,449	132	655	55	51	1,345
San Francisco	....	....	....	....	....	....	....	....
San Joaquin	40,000	25,000	9,000	6,000	1,000	1,200	750	2,700
San Luis Obispo	1,500	2,000	1,000	500	200	100	50	100
San Mateo	6,000	2,750	2,575	2,235	1,873	1,897	1,576	1.236
Santa Barbara	4,800	6,100	2,700	600	140	270	296	2,200
Santa Clara	106,449	44,612	33,259	31,553	19,484	1,480	2,266	3,658
Santa Cruz	32,905	5,001	3,428	4,813	1,439	92	222	644
Shasta	94,200	65,340	8,542	4,580	856	738	320	450
Sierra	8,000	4,900	990	394	420	105	120	40
Siskiyou	60,000	5,003	1,066	614	300	104	67	56
Solano	17,468	10,830	4,398	4,038	6,870	1,051	1,354	27,498
Sonoma	29,086	62,300	16,175	44,890	8,321	1,070	2,827	1,686
Stanislaus	3,000	5,000	9,500	750	130	90	78	340
Sutter	32,000	17,186	5,201	2,349	743	1,052	896	2,165
Tehama	7,000	28,000	2,600	1,400	500	950	380	2,000
Trinity	19,922	2,559	2,110	889	310	105	65	55
Tulare	17,328	22,241	3,935	2,075	878	435	342	1,727
Tuolumne	80,000	100,000	20,000	15,000	8,000	5,000	2,000	2,300
Yolo	34,942	23,638	7,675	4,942	3,648	1,020	1,884	4,550
Yuba	38,000	25,700	8,900	5,900	1,900	2,300	3,000	4,500
Totals	1,370,971	882,338	297,841	249,464	144,120	43,776	36,940	92,326

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of fig trees..	Number of lemon trees	Number of orange trees	Number of olive trees	Number of prune trees	Number of mulberry trees	Number of almond trees........	Number of walnut trees ....
Alameda	817	62	82	587	3,066	1,204	152,956	3,576
Alpine	....	....	....	....	....	....	....	....
Amador	1,410	190	310	22	178	640	1,710	560
Butte	2,359	359	541	88	134	2,464	2,336	1,615
Calaveras	1,441	....	52	....	60	565	201	104
Colusa	1,000	....	....	....	....	50	500	50
Contra Costa	670	35	80	100	100	7,000	300	2,800
Del Norte	....	....	....	....	....	....	....	32
El Dorado	985	....	....	....	....	5,415	219	119
Fresno	300	....	4	....	30	12	32	97
Humboldt	8	....	....	....	....	....	22	65
Inyo	12	....	....	....	....	20	....	30
Kern	390	40	35	50	100	50	200	300
Klamath	....	....	....	....	....	....	....	....
Lake	60	....	....	....	11	3,541	138	71
Lassen	1	....	....	....	....	....	16	101
Los Angeles	2,000	4,500	34,300	2,000	120	150,000	700	5,300
Marin	37	....	....	....	....	....	43	....
Mariposa	400	....	....	....	....	200	30	50
Mendocino	75	....	....	....	....	....	50	150
Merced	1,000	....	1	....	20	100	50	20
Mono	....	....	....	....	....	....	....	....
Monterey	216	49	....	46	311	2,157	412	183
Napa	875	30	70	260	210	58,250	3,470	1,110
Nevada	194	....	1	....	5	31,021	23	46
Placer	2,497	13	43	7	304	44,040	778	289
Plumas	15	....	....	....	3	....	10	3
Sacramento	4,541	633	1,039	147	713	84,280	4,638	50,973
San Bernardino	978	268	7,111	106	94	379	212	8,199
San Diego	574	703	1,833	262	37	126	104	134
San Francisco	....	....	....	....	....	....	....	....
San Joaquin	3,000	35	30	25	270	450	300	550
San Luis Obispo	150	50	75	1,000	75	75	50	25
San Mateo	851	....	....	....	....	25,000	650	1,080
Santa Barbara	3,800	650	450	7,200	76	22,560	283,400	38,100
Santa Clara	1,522	1,035	3,101	1,044	6,420	1,564	2,933	2,770
Santa Cruz	256	....	5	8	155	244	109	469
Shasta	634	6	18	....	8	15	120	100
Sierra	12	2	1	....	28	20	15	20
Siskiyou	....	....	....	....	....	9,416	....	351
Solano	3,480	....	177	62	268	....	5,059	1,727
Sonoma	1,520	....	56	....	425	2,877	3,598	1,709
Stanislaus	600	....	20	....	....	....	....	....
Sutter	1,975	75	97	10	178	4,028	657	1,275
Tehama	1,000	4	20	200	5,130	300	8,000	1,020
Trinity	....	....	....	....	....	....	4	18
Tulare	1,825	163	137	2	31	749	219	314
Tuolumne	1,500	....	....	....	....	500	100	100
Yolo	5,070	21	217	16	315	92,820	3,300	3,310
Yuba	2,500	50	250	40	50	900	7,200	700
Totals	52,550	8,973	50,156	13,282	18,925	553,032	484,864	129,615

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of gooseberry bushes	Number of raspberry bushes	Number of strawberry vines	No. of grape vines	Gallons of wine	Gallons of brandy	BREWERIES.	
							Number	Gallons
Alameda				223,102	76,000		8	221,400
Alpine							1	1,000
Amador				1,348,600	51,100	1,950	4	28,920
Butte				739,861	47,482	3,400	3	14,400
Calaveras				460,355	65,770	1,787	5	29,035
Colusa	500	100	2,000	200,000			1	10,000
Contra Costa				400,000	80,000		1	
Del Norte				34			1	6,000
El Dorado				1,571,196	192,865	6,665	4	
Fresno				15,931				
Humboldt				500			2	
Inyo				6,000			2	16,000
Kern				14,773			2	3,000
Klamath				2,475				
Lake				34,841				
Lassen				2,844				
Los Angeles				4,140,000	1,495,000	57,600	2	32,000
Marin				12,493	2,155		1	8,000
Mariposa				200,000	15,000	1,000		
Mendocino				4,200			5	18,000
Merced				75,000	14,018	1,000		
Mono								
Monterey				201,800	7,200	2,875	3	14,000
Napa				2,324,545	464,320	13,999	2	38,000
Nevada				234,518	100,000	1,000	15	70,000
Placer				653,272	93,005	4,724	7	74,283
Plumas	15,000	800	600,000	500				
Sacramento				2,113,236	184,666	20,560	8	252,000
San Bernardino	1,833	184	90,540	377,476	93,575	4,975	2	5,000
San Diego				72,710	3,500		2	18,000
San Francisco								
San Joaquin				1,000,000	35,000	250	3	44,700
San Luis Obispo				50,000	400		1	10,600
San Mateo				15,000			2	
Santa Barbara				1,896,000	28,000	800	2	14,400
Santa Clara				1,060,079	121,451	2,967	6	2,500,000
Santa Cruz				242,557	37,200	560	4	29,160
Shasta				480,596	30,180	1,240	1	10,000
Sierra				14,000	1,300		7	3,400
Siskiyou				60,000	350		4	29,340
Solano				1,005,765	127,491	5,140	3	72,800
Sonoma				4,798,348	876,328	1,250	4	85,109
Stanislaus				350,000	32,000	600	2	
Sutter				567,100	63,011	6,078	1	2,070
Tehama	3,854	780,000	6,832,148	1,136,122	80,000	1,375	1	4,800
Trinity				15,105	275		2	10,000
Tulare				236,782	13,910	1,890	3	11,250
Tuolumne				1,500,000	82,000	1,500	6	46.500
Yolo				546,550	18,827	500	3	37,000
Yuba				485,000	81,500	1,450	1	300
Totals	21,187	781,084	7,524,688	30,889,366	4,614,879	147,135	137	3,770,467

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of horses...	Number of mules...	Number of asses....	Number of cows.....	Number of calves...	Number of beef cattle..................	Number of oxen.....	Total number of neat cattle.........
Alameda	6,711	631	14	5,095	4,740	5,203	134	22,528
Alpine	180	16		228	200	244	84	756
Amador	3,940	370	1	1,564	1,400	1,680	160	4,804
Butte	6,594	907	110	4,526	3,542	10,331	257	18,656
Calaveras	3,448	242	24	4,168	3,308	2,645	130	10,251
Colusa	9,000	1,600	50	3,500	3,000	9,000	50	15,600
Contra Costa	5,379	493		7,816	3,874	5,886		17,576
Del Norte	696	122		1,026	830	545	74	2,475
El Dorado	1,924	158	21	4,340	1,480	4,554	220	10,594
Fresno	4,430	439	109	17,719	17,268	4,035	158	39,180
Humboldt	7,063	704	18	14,117	10,360	10,045	513	35,338
Inyo	3,200	414	37	1,046		5,248	161	6,455
Kern	4,881	469	78	3,849	4,727	4,104	306	49,813
Klamath	397	464	4	673	2,189	46	69	2,977
Lake	1,298	110	6	2,096	2,197	480	53	4,826
Lassen	2,134	226	2	4,263	3,621	6,846	54	4,784
Los Angeles	12,500	2,300	240	4,100	3,000	10,300	300	17,700
Marin	2,945	133		19,140	5,879	457	247	35,941
Mariposa	1,558	279	54	2,012	1,312	359	144	7,127
Mendocino	8,222	962	26	3,873		1,019	360	35,582
Merced	2,916	598	21	1,126	290	8,861	15	10,792
Mono	926	103	10	3,368	2,837	397	125	6,727
Monterey	9,217	516	29	9,011	4,283	28,812	49	32,155
Napa	5,300	520	20	4,620	5,335	875	40	10,870
Nevada	2,330	118		2,314	1,369	2,481	285	6,449
Placer	3,014	296	19	2,636	3,519	449	392	7,147
Plumas	1,361	138	21	3,081	2,900	1,495	90	7,566
Sacramento	9,644	330	12	7,534	8,669	3,214	275	19,692
San Bernardino	1,987	197	12	2,181	1,632	1,365	106	5,375
San Diego	6,019	636	32	1,792	3,864	1,181	265	19,095
San Francisco								
San Joaquin	12,000	900	12	4,500	4,750	7,500	30	16,780
San Luis Obispo	5,071	345	77	6,650	8,262	1,524	24	44,383
San Mateo	4,208	316	11	6,927	3,367	2,704	167	23,272
Santa Barbara	6,503	650	50	4,875	3,850	18,870	42	27,637
Santa Clara	9,801	439	25	10,268	4,944	9,368	93	37,837
Santa Cruz	3,231	216	10	4,200	4,663	1,500	531	10,894
Shasta	2,745	236	21	4,307	3,658	2,158	155	10,278
Sierra	703	104		1,097	980	1,617	129	3,823
Siskiyou	7,133	824	20	2,498	12,954	12,500	150	28,102
Solano	5,644	1,070	10	9,786	5,087	680	10	15,263
Sonoma	11,977	641	23	17,637	20,168	1,621	282	39,708
Stanislaus	6,932	942	10	7,080	1,230			5,870
Sutter	6,270	545	3	3,273	3,504	4,770	55	11,682
Tehama	4,560	309	9	7,114	1,954	4,125	324	13,669
Trinity	647	167	4	1,204	1,087	910	100	3,201
Tulare	7,357	307	37	16,242	5,466	5,450	110	27,268
Tuolumne	2,335	188	34	2,331	4,000	1,542	95	7,968
Yolo	7,196	1,167	17	3,180	1,868	4,478		9,824
Yuba	3,752	319	13	4,162	1,349	4,980	116	10,607
Totals	237,280	24,176	1,356	260,145	200,766	218,454	7,529	816,897

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of sheep...	Number of Cashmere and Angora goats..........	Number of hogs.....	Number of chickens	Number of turkeys.	Number of geese....	Number of ducks...	Number of hives of bees ....
Alameda	38,360	46	2,556					300
Alpine		400	57					10
Amador	18,040	17	2,140					740
Butte	63,968	255	15,566					545
Calaveras	36.869	2,891	4,479					624
Colusa	180,000	500	16,000					1,000
Contra Costa	14,744	27	4,209					300
Del Norte	430		650					125
El Dorado	10,594	68	2,728					368
Fresno	164,266	1,706	8,855					37
Humboldt	37,477	10	5,670					264
Inyo	1,100		681					37
Kern	101,903		2,190					50
Klamath	17		863					70
Lake	11,971	2	1,396					
Lassen	4,100		931					5
Los Angeles	341,000	110	5,300					2,070
Marin								77
Mariposa	53,952	20	2,640					
Mendocino	121,292	1	5,800					500
Merced	149,344	1	3,231					200
Mono	4,215		184					5
Monterey	194,720	2,968	8,717					4,813
Napa	15,870	225	5,300					300
Nevada	3,589		2,105					149
Placer	56,086		5,082					757
Plumas	3,294	60	600					50
Sacramento	128,328		3,880					610
San Bernardino	25,735	5	603					819
San Diego	70,295	864	1,133					1,136
San Francisco								
San Joaquin	55,000	25	1.250					250
San Luis Obispo	250,294	1,160	3,802					300
San Mateo	1,396		4,208					500
Santa Barbara	212,320		4,100					420
Santa Clara	45,093	247	6,880					757
Santa Cruz	1,755		3,795					50
Shasta	38,734		7,252					799
Sierra	1,151	2	858					148
Siskiyou	24,874		1,300					637
Solano	41,414	110	6,500					20
Sonoma	90,974	693	14,899					307
Stanislaus	86,000		2,000					400
Sutter	21,683		7,920					600
Tehama	217,000	300	19,000					300
Trinity	160	1	453					150
Tulare	144,423		5,643					523
Tuolumne	9,775	2,659	2,177					400
Yolo	32,724		7,890					446
Yuba	31,864		5,584					300
Totals	3,158,193	15,373	219,057					23,268

Table of Statistics—Continued.

COUNTIES.	GRIST MILLS.				Barrels of flour made.	Bushels of corn ground...........	SAW MILLS.		Feet of lumber sawed...........	Number of shingles made...........
	Steam power.	Run of stone.	Water power.	Run of stone.			Steam power.	Water power.		
Alameda	3	9	2	3	26,000	2,400	....	....	....	....
Alpine	....	....	....	....	....	....	2	2	1,500,000	500,000
Amador	1	3	1	2	5,850	12,190	3	....	4,990,640	1,396,640
Butte	1	4	3	7	75,000	12,950	19	3	15,000,000	1,000,000
Calaveras	....	....	....	....	....	....	4	1	3,198,000	3,090,000
Colusa	3	8	....	....	....	....	2	....	200,000	....
Contra Costa	4	11	....	....	8,000	1,000	....	....	....	....
Del Norte	1	1	1	2	600	230	2	3	6,300,000	200,000
El Dorado	1	2	....	....	....	....	8	2	1,282,900	....
Fresno	....	....	2	3	5,700	3,500	2	1	1,500,000	50,000
Humboldt	1	1	1	1	3,000	480	8	2	50,000,000	15,200,000
Inyo	....	....	2	4	2,500	3,200	....	3	2,000,000	1,000,000
Kern	....	....	3	6	8,000	1,000	4	1	3,000,000	100,000
Klamath	....	....	....	....	....	....	2	9	4,000,000	1,500,000
Lake	2	2	1	2	5,800	2,100	3	2	1,940,000	....
Lassen	....	....	2	3	1,700	450	1	2	2,150,000	125,000
Los Angeles	....	....	5	10	2,600	40,000	2	....	20,000	....
Marin	....	....	....	....	....	....	1	....	....	....
Mariposa	....	....	....	....	....	....	7	....	1,600,000	200,000
Mendocino	4	5	3	3	....	....	16	3	49,600,000	80,500,000
Merced	....	....	3	8	9,000	5,000	....	....	....	....
Mono	....	....	1	2	750	150	2	3	600,000	50,000
Monterey	2	2	1	1	1,980	280	....	....	....	....
Napa	2	6	2	3	14,370	5.650	1	....	60,000	....
Nevada	1	4	....	....	20,530	1,800	17	4	32,300,000	7,000,000
Placer	1	2	....	....	21,000	1,800	17	5	5,800,000	1,200,000
Plumas	1	2	....	....	1,500	....	3	13	3,000,000	350,000
Sacramento	4	18	1	1	227,300	14,100	2	....	....	....
San Bernardino	....	....	3	6	7,350	8,000	4	....	3,000,000	500,000
San Diego	1	3	2	3	300	5,000	1	1	350,000	100,000
San Francisco	....	....	....	....	....	....	....	....	....	....
San Joaquin	4	17	....	....	65,000	4,000	....	....	....	....
San Luis Obispo	1	1	3	6	3,000	1,200	2	....	518,000	....
San Mateo	1	2	1	1	....	....	9	1	10,000,000	12,000,000
Santa Barbara	2	2	1	1	....	....	....	....	....	....
Santa Clara	7	22	2	7	65,550	2,830	3	2	15,000,000	....
Santa Cruz	3	7	2	5	21,683	3,929	13	5	12,500,000	7,000,000
Shasta	....	....	2	4	8,000	1,350	1	14	5,225,000	....
Sierra	....	....	1	2	228	....	10	8	5,500,000	482,000
Siskiyou	1	2	7	10	20,561	1,500	5	13	52,000,000	100,000,000
Solano	3	10	....	....	115,000	6,000	....	....	....	....
Sonoma	6	26	2	3	75,063	6,399	13	1	14,693,327	4,286,890
Stanislaus	1	3	1	4	29,000	800	....	....	....	....
Sutter	....	....	....	....	....	....	....	....	....	....
Tehama	....	....	3	8	46,212	2,230	4	2	10,000,000	300,000
Trinity	....	....	1	2	....	75	....	11	950,000	....
Tularo	1	3	2	4	8,867	468	3	1	250,000	250,000
Tuolumne	....	....	4	8	11,000	2,000	6	2	4,000,000	2,000,000
Yolo	3	9	....	....	43,200	750	2	....	....	....
Yuba	3	12	1	3	80,000	19,000	4	4	2,864,000	....
Totals	69	199	72	138	1,041,194	173,811	198	124	326,891,867	190,300,530

TABLE OF STATISTICS—Continued.

COUNTIES.	QUARTZ MILLS.		MINING DITCHES.			IRRIGATING DITCHES.		WOOLEN MILLS.		COTTON MILLS.		COAL.	RAILROADS.	
	Number	Tons crushed.	Number	Miles in length	Am't of water used per day—inches	Number	Acres irrigated	Number	Pounds of wool used	Number	Pounds of cotton used.	Tons mined	Number	Miles in length
Alameda													3	92¾
Alpine	4					2	2,000							
Amador	24	252,000	46	470	5,980									
Butte	17		10	219	30,600	6	2,000						2	58
Calaveras	26	37,105	22	482	3,050								1	66/100
Colusa														
Contra Costa												120,000	2	11½
Del Norte			25	42	5,300	6	150						2	4
El Dorado	40		54	850	6,720	27	1,320						1	18¾
Fresno	2	100		2	40	10	3,000							31½
Humboldt													1	2
Inyo	3	8,000												
Kern	13	8,000				3	10,000							
Klamath	4	6,000	60	100	10,000	30	700							
Lake														
Lassen	1	75	3	8	400	2	1,100							
Los Angeles	1	3,000	4	21	2,860	52	27,700						1	20½
Marin													1	3½
Mariposa	34	18,000	10	66		60	250							
Mendocino														
Merced						6	10,000						1	31 45/100
Mono	3	900	1	4	300									
Monterey													1	18
Napa													2	41
Nevada	46	105,633	74	667	36,225	10	1,000						1	30¼
Placer	12	9,000	52	364		5	1,750						3	112¾
Plumas	14	30,000		800	25,000	40	2,200							
Sacramento			4	97	5,700	1	10	1					4	63
San Bernardino	2		1	3	130	11	3,000							
San Diego	7	10,000												
San Francisco								2	3,700,000					
San Joaquin						2	3,500	1	45,000				4	94 56/100
San Luis Obispo						2	400							
San Mateo													1	25 5/100
Santa Barbara						1	2,500							
Santa Clara						5	465	2	195,000				4	70
Santa Cruz													1	2¼
Shasta	5	800	86	363	12,250	75	2,140							
Sierra	24	74,000	50	213	2,800									
Siskiyou	3	3,000	18	220	10,800	24	6,045							
Solano													2	45½
Sonoma													2	62
Stanislaus			2	10	500								3	33
Sutter						1	360						2	34
Tehama			1	7	160	40	2,000						1	47
Trinity			224	430	47,850									
Tulare	2	300				13	6,500						1	40
Tuolumne	20	7,000	4	100	2,400	100	5,000							
Yolo						2	15,000						2	32
Yuba	4		21	80	5,000	10	1,000	1	251,000				2	26 87/100
Totals	311	572,913	772	5,618	214,065	546	111,090	7	4,191,000			120,000	51	1,042 14/100

TABLE OF STATISTICS—Continued.

COUNTIES.	ASSESSED VALUE OF PROPERTY—1872.				Estimated total population.........	Registered voters...	Poll tax collected in 1871..................
	Real estate...	Improvem'ts	Personal property ...	Total valuation..........			
Alameda	27,486,940	5,498,020	6,748,655	39,733,615	35,000	6,474	8,086
Alpine	161,700	121,845	215,863	499,408	800	240	202
Amador	1,839,348	700,055	3,016,019	5,555,422	11,360	3,140	3,450
Butte	3,483,369	1,121,150	2,565,567	7,170,086	12,500	3,931	7,124
Calaveras	234,256	497,748	778,149	1,510,153	9,986	3,150	1,425
Colusa	5,595,019	....	2,832,994	8,428,013	8,000	2,700	1,000
Contra Costa	4,905,703	824,310	1,820,208	7,550,221	10,000	2,650	3,000
Del Norte	170,467	185,615	330,643	686,725	2,500	537	1,277
El Dorado	414,327	911,088	1,077,038	2,402,453	9,600	4,624	2,725
Fresno	3,139,934	267,378	1,849,849	5,257,161	4,250	800	732
Humboldt	1,803,871	778,245	2,218,476	4,800,592	11,500	2,744	2,900
Inyo	298,734	208,048	1,023,739	1,430,521	2,100	700	400
Kern	1,088,432	234,282	1,443,293	2,766,007	4,000	900	281
Klamath	243,344	72,979	292,583	608,906	3,300	410	699
Lake	890,634	313,087	587,649	1,791,370	2,969	1,141	1,185
Lassen	125,488	149,962	662,606	938,056	1,500	418	323
Los Angeles	5,264,888	1,779,596	3,510,108	10,554,592	17,400	4,530	3,600
Marin	7,976,487	1,260,950	2,221,004	11,458,441	....	....	....
Mariposa	410,755	397,299	672,879	1,480,933	*4,560*	*1,300*	*1,366*
Mendocino	1,985,184	749,655	2,573,884	5,308,723	*11,000*	*3,000*	*3,400*
Merced	4,918,243	422,860	1,889,634	7,230,737	*3,500*	*1,066*	*380*
Mono	79,615	99,320	283,360	362,295	550	453	236
Monterey	8,266,989	830,601	3,246,185	12,343,775	10,887	2,596	2,712
Napa	4,264,775	1,794,000	2,176,812	8,235,587	11,200	2,297	1,318
Nevada	3,768,045	1,581,531	2,691,892	8,041,468	19,134	6,100	10,780
Placer	4,514,477	....	1,936,910	6,451,387	14,000	3,312	3,145
Plumas	165,852	237,844	720,175	1,123,871	7,000	1,280	1,265
Sacramento	8,672,094	7,280,395	12,939,787	28,892,276	35,000	7,500	11,400
San Bernardino	672,396	256,336	517,549	1,446,281	7,000	1,583	383
San Diego	1,582,684	228,580	807,664	2,618,928	7,359	1,998	450
San Francisco	187,289,301	with improvements.	110,595,941	297,885,242	175,000	....	35,000
San Joaquin	11,177,342	4,018,185	5,327,459	20,522,986	25,000	5,250	4,760
San Luis Obispo	1,739,317	249,145	1,565,650	3,554,112	6,000	2,000	600
San Mateo	7,864,165	904,680	1,251,890	10,020,735	7,370	2,000	1,326
Santa Barbara	3,404,592	651,809	1,943,831	6,000,232	8,400	1,860	....
Santa Clara	18,132,250	5,457,222	6,431,894	30,021,366	27,000	5,510	24,320
Santa Cruz	3,751,688	1,237,899	2,232,125	7,221,712	9,000	2,257	4,266
Shasta	323,303	228,003	1,001,487	1,552,793	6,000	1,630	2,350
Sierra	861,875	643,640	818,344	2,323,859	5,800	2,200	3,600
Siskiyou	744,811	465,947	2,479,015	3,689,773	8,000	2,131	1,951
Solano	7,241,720	1,697,757	2,729,260	11,668,737	16,571	5,062	4,000
Sonoma	10,763,799	3,085,264	6,038,287	19,887,350	25,000	....	4,119
Stanislaus	4,173,450	590,654	2,141,941	6,906,045	6,500	2,000	610
Sutter	3,006,101	455,115	1,230,315	4,691,531	6,550	1,307	....
Tehama	1,646,967	292,805	1,829,095	3,768,867	6,500	1,635	1,100
Trinity	165,842	124,307	420,309	710,458	3,275	860	1,060
Tulare	1,113,565	397,241	1,639,384	3,150,190	7,400	1,384	1,680
Tuolumne	421,320	316,795	696,035	1,434,150	8,000	2,800	1,400
Yolo	5,161,728	945,163	2,535,894	8,642,785	11,000	4,428	3,476
Yuba	1,567,450	1,597,605	2,450,580	5,615,635	11,500	3,795	3,671
Totals	374,774,636	54,098,925	217,072,990	645,946,561	657,821	119,683	174,533

[STATISTICAL TABLES FOR 1873.]

TABLE OF STATISTICS.

Industrial and other statistical information for the year eighteen hundred and seventy-three, as reported to the Surveyor General by the several County Assessors, embracing the entire State.

COUNTIES.	Acres of land inclosed in 1872..........	Acres of land cultivated in 1872..........	WHEAT.		BARLEY.		Acres of land cultivated in 1873..........	Acres of wheat sown in 1873..	Acres of barley sown in 1873..
			Acres....	Bushels.	Acres....	Bushels.			
Alameda	122,180	117,767	71,942	1,711,807	14,195	595,257	112,000	75,000	13,500
Alpine	10,000	2,862	500	7,500	650	10,400		500	700
Amador	60,184	6,713	845	21,125	1,520	45,360			
Butte	171,061	83,606	46,636	932,720	16,040	449,138		49,400	15,600
Calaveras	48,035	11,200	542	6,499	1,696	30,838		800	2,200
Colusa	250,000	165,000	150,000	3,000,000	10,000	220,200		200,000	10,000
Contra Costa	174,289	83,890	61,748	1,887,320	16,296	664,254			
Del Norte	10,710	1,820	210	3,930	190	5,800		243	175
El Dorado	68,000	10,643	502	4,321	619	6,023		500	400
Fresno	55,734	18,506	8,972	92,968	9,451	142,689		17,683	12,295
Humboldt	49,205	15,160	1,510	37,750	582	17,460		1,645	790
Inyo		6,443	1,080	17,645	2,520	22,326	5,480	628	1,648
Kern	26,811	9,652	2,244	38,433	2,363	60,146		4,000	4,500
Klamath	8,000	2,400	200	4,000	60	700		210	55
Lake	31,550	7,338	3,450	70,276	2,014	49,193			
Lassen	23,025	4,988	1,758	32,327	1,859	47,717		1,975	2,250
Los Angeles	46,000	48,700	500	10,700	11,800	318,000		650	12,900
Marin	287,186	16,485	2,469	46,210	852	23,456			
Mariposa									
Mendocino									
Merced	86,192		200,000	1,426,897	75,000	306,967		144,490	17,427
Mono	*5,995*	*710*	*200*	*3,100*	*275*	*3,085*		*215*	*280*
Monterey	*354,640*	*195,200*	*116,550*	*2,331,000*	*48,250*	*1,447,500*		*127,750*	*39,200*
Napa	109,730	48,735	31,780	395,350	4,070	81,400		33,150	3,840
Nevada									
Placer	52,813	33,966	15,912	212,650	4,767	70,240		16,637	5,267
Plumas	48,220	3,900	1,203	19,075	669	16,368			
Sacramento	294,621	64,716	7,662	122,757	21,967	293,866		7,844	23,253
San Bernardino	21,500	9,000	2,419	20,013	3,757	25,000		2,500	4,000
San Diego	8,546	10,491	2,342	11,442	5,937	17,817		2,500	6,000
San Francisco									
San Joaquin	275,000	225,000	186,125	2,667,800	29,375	538,840		190,000	33,000
San Luis Obispo	120,000	30,000	3,000	45,000	20,000	400,000		3,500	25,000
San Mateo	79,130	31,534	5,852	127,001	5,460	169,713		6,097	5,813
Santa Barbara	31,270	15,285	1,900	Cut for hay.	2,210	66,300		5,797	2,790
Santa Clara	501,723	185,657	172,573	1,578,843	12,444	121,137		163,789	13,437
Santa Cruz	69,170	18,496	7,4×0	193,480	3,336	132,012		7,890	4,420
Shasta	57,000	31,350	7,672	104,250	7,640	152,740		8,280	7,645
Sierra	37,106	3,340	1,190	16,120	1,036	20,410		1,320	1,090
Siskiyou	125,000	45,000	10,313	164,695	2,344	46,880		12,413	2,917
Solano	153,216	88,744	60,698	616,235	14,825	59,385			
Sonoma	359,405	56,002	18,871	312,321	6,165	135,946		28,786	5,969
Stanislaus	45,000	401,000	360,000	5,000,000	40,000	800,000		365,000	35,500
Sutter	234,450	120,830	60,060	885,744	12,120	251,878		100,785	20,132
Tehama									
Trinity	9,107	5,519	709	10,101	73	783		690	583
Tulare	64,371	32,882	11,559	97,729	17,848	129,240		15,412	23,797
Tuolumne			5,500	82,500	1,000	9,000	40,000	4,500	900
Ventura									
Yolo	76,640	155,355	79,040	1,533,333	12,340	244,800	163,460	80,725	11,320
Yuba	116,717	51,127	13,950	186,700	8,600	125,200		13,318	8,869
Totals	4,843,532	2,477,012	1,739,668	26,089,667	454,215	8,405,464	320,940	1,696,622	379,462

TABLE OF STATISTICS—Continued.

COUNTIES.	OATS.		RYE.		CORN.		BUCKWHEAT.		PEAS.	
	Acres......	Bushels....	Acres......	Bushels....	Acres......	Bushels....	Acres......	Bushels....	Acres......	Bushels....
Alameda	1,330	39,828			1,365	40,790	4	15	150	3,000
Alpine	400	7,200	50	600	100	2,250			10	200
Amador					475	19,028				
Butte	346	12,100	340	5,400	70	24,600				
Calaveras					249	6,370				
Colusa	1,000	25,000			500	5,000				
Contra Costa	4,312	161,363	72	1,676	176	9,420			8	200
Del Norte	544	15,300			39	1,890			64	1,520
El Dorado	150	718	166	401	40	113				
Fresno	936	140	46	285	226	6,140				
Humboldt	4,685	234,250			168	7,355	8	200	1,041	62,460
Inyo	450	4,500			1,600	23,922				
Kern	214	6,191	130	2,485	1,039	19,830	26	362	62	871
Klamath	100	1,300	20	150	70	900				
Lake	125	2,225	5	115	225	5,720				
Lassen	1,356	37,013			3	123	1	26	1	54
Los Angeles	370	250	150	4,200	12,000	562,000	70	1,600	95	2,370
Marin	9,654	231,464								
Mariposa										
Mendocino										
Merced		250				9,240				
Mono	205	4,100								
Monterey	500	1,500	200	4,000	1,550	46,500	160	4,800	150	4,500
Napa	1,590	48,150	35	525	2,230	78,050			5	110
Nevada										
Placer	4,950	Cut for hay.	250	3,176	48	1,570				
Plumas	1,688	58,610			4¼	80			3	100
Sacramento	2,528	48,486	7	140	1,954	62,960	71	1,730	15	850
San Bernardino	26	750			800	19,880				
San Diego	¼	20	7¼	83	338	7,970	1	10	10	300
San Francisco										
San Joaquin	79	2,850	331	3,950	1,495	41,850			10	350
San Luis Obispo					300	7,500			20	400
San Mateo	8,857	340,655	40	800	35	955	9	275		
Santa Barbara	100	Cut for hay.			1,100	44,000				
Santa Clara	734	11,343	233	2,269	134	5,816			4	83
Santa Cruz	2,112	69,584	123	2,706	1,246	22,528	28	664		
Shasta	231	5,204			125	2,630				
Sierra	590	12,100								
Siskiyou	4,500	112,500	45	675	120	4,756	43	645	34	510
Solano	500	3,165			625	3,840			50	118
Sonoma	4,407	92,410	3	100	4,556	122,268	12	270		
Stanislaus					200	10,500				
Sutter	300	8,765			1,025	25,625	50	1,500		
Tehama										
Trinity			10	100	40	295			2	50
Tulare	1,272	31,811	200	4,400	650	13,500				
Tuolumne	150	1,459	70	1,100	175	3,000			12	4,000
Ventura										
Yolo					80	1,600			18	450
Yuba	676	11,210			850	35,500	35	1,660		
Totals	61,967	1,643,964	2,533	39,336	38,025	1,307,864	518	13,757	1,764	82,496

TABLE OF STATISTICS—Continued.

COUNTIES.	PEANUTS.		BEANS.		CASTOR BEANS.		POTATOES.		SWEET POTATOES.	
	Acres........	Pounds......	Acres........	Bushels......	Acres........	Pounds......	Acres........	Tons	Acres........	Tons ....
Alameda			405	13,960			325	325		
Alpine			5	125			50	100		
Amador							50	220	5	22
Butte	20	6,000	15	540			100	250	25	75
Calaveras							256	640		
Colusa			5	100			40	80	20	50
Contra Costa			172	5,490	10	3,000	174	890	4	30
Del Norte			8	160			147	521		
El Dorado										
Fresno			45	245			27	91	16	25
Humboldt			1	10			3,148	21,480		
Inyo			322	4,830			350	350		
Kern	22	4,465	99	2,802			145	413	50	50
Klamath			30	800			70	90		
Lake							27	63		
Lassen			2	41			46	185		
Los Angeles	92	83,700	1,090	21,800	110	110,720	1,570	7,800	150	900
Marin							1,014	1,541		
Mariposa										
Mendocino										
Merced		14,000		4,300				18		8
Mono							30	50		
Monterey			1,350	3,375			2,150	3,225		
Napa			6	95			55	149		
Nevada							300	1,000		
Placer		3,721					30	25		
Plumas							98	292		
Sacramento	15	20,000	550	14,310			1,296	5,664	592	2,173
San Bernardino			8	320			60	172	15	30
San Diego			33	1,369			178	235	3	2
San Francisco										
San Joaquin			20	775			175	593		
San Luis Obispo			300	1,200			120	480		
San Mateo			53	1,830			3,169	8,242		
Santa Barbara			250	1,250			100	200		
Santa Clara							183	3,412	5	30
Santa Cruz			228	3,776			550	1,852		
Shasta			18	343			224	556	4	9
Sierra							120	340		
Siskiyou			67	1,340			324	197		
Solano			30	360	20	4,212				
Sonoma			1	5			3,725	7,840		
Stanislaus										
Sutter	1	700	150	3,750	40	35,000	200	400	325	1,625
Tehama										
Trinity			26	426			109	338		
Tulare			40	900			478	500	26	60
Tuolumne			400	7,000			400	4,500		
Ventura										
Yolo	30	35,000	312	12,480			60	240	70	350
Yuba			30	1,500	120	81,000	73	260	14	100
Totals	180	167,586	6,091	111,607	300	233,932	21,746	75,819	1,324	5,519

TABLE OF STATISTICS—Continued.

COUNTIES.	ONIONS.		HAY.		FLAX.		HOPS.		TOBACCO.		SUGAR BEETS.
	Acres	Bushels	Acres	Tons	Acres	Pounds	Acres	Pounds	Acres	Pounds	Tons
Alameda	270	16,900	8,929	19,046			28	24,500			10,260
Alpine	2	100	1,095	1,095							
Amador			3,873	4,238			18	17,200			
Butte	30	1,800	18,000	15,600							400
Calaveras	75	3,000	6,737	6,398							
Colusa	5	150	4,000	6,000							
Contra Costa	18	3,150	19,213	25,308							3,087
Del Norte	2	200	786	1,124							24
El Dorado			3,557	1,724							
Fresno	5	85	2,122	3,434							
Humboldt	2½	250	3,406	6,485							410
Inyo	20	240	2,000	2,000							11
Kern	34	1,690	2,952	3,801							36
Klamath	4	90	1,450	5,050							
Lake			3,843	4,867			12	2,715			
Lassen	3	286	6,605	10,327							12
Los Angeles	97	34,600	2,970	7,430	2		40	60,000	50	25,000	
Marin			2,496	2,963							
Mariposa											
Mendocino											
Merced		20		4,517				16,000			
Mono			4,000	4,500							
Monterey	5	375	11,000	33,000	2,900	Cut for seed.	25		105		
Napa	4	320	9,120	11,150			45	81,220			185
Nevada			3,000	2,750							
Placer			5,845	8,000							
Plumas	1	25	20,513	20,582							15
Sacramento	49	6,199	29,973	24,925		170	154	181,260			12,655
San Bernardino	5	1,650	900	2,100							20
San Diego	10	500	1,459	642							100
San Francisco											
San Joaquin	10	1,725	17,500	16,750			19	10,700			
San Luis Obispo	6	500	20,000	30,000							500
San Mateo	17	1,720	7,892	12,538	140	140,000	14	14,000			1,716
Santa Barbara											
Santa Clara	46	5,630	25,322	46,978			89	46,259			
Santa Cruz			2,411	3,013	917	994,586	60	21,200			38
Shasta	3	185	8,350	8,764							
Sierra	14	700	10,370	11,210							
Siskiyou	15	900	7,314	10,921							
Solano			11,996	12,348							130
Sonoma			19,694	24,593			7½	5,200			9
Stanislaus			1,000	1,090							
Sutter	12	1,200	12,275	24,550			20	1,550			
Tehama											
Trinity	4½	370	2,214	2,370							
Tulare			5,800	3,400							
Tuolumne	150	3,000	20,000	25,000					25	4,000	22
Ventura											
Yolo	22	3,760	9,063	12,328							300
Yuba			14,570	10,460							
Totals	940	91,320	375,615	495,279	3,959	1,134,756	531	481,804	180	29,000	29,930

TABLE OF STATISTICS—Continued.

COUNTIES.	COTTON.		Pounds of butter...	Pounds of cheese..	Pounds of wool....	Number of hives of bees............	Pounds of honey...
	Acres.........	Pounds					
Alameda	....	....	162,750	....	182,315	197	1,650
Alpine	....	....	60,000	....	800	32	400
Amador	....	....	....	....	113,400	....	....
Butte	....	....	16,000	....	362,400	587	4,000
Calaveras	....	....	28,650	500	211,417	446	3,500
Colusa	....	....	5,000	....	800,000	580	2,000
Contra Costa	....	....	149,991	68,816	40,050	151	4,250
Del Norte	....	....	45,320	49,020	2,046	156	1,320
El Dorado	....	....	12,176	794	6,205	....	....
Fresno	147	8 084	5,300	500	1,122,192	96	2,650
Humboldt	....	....	86,670	2,000	160,244	247	2,975
Inyo	....	....	5,000	....	3,700	128	896
Kern	40	20,000	4,000	1,000	1,000,000	90	1,000
Klamath	....	....	2,000	....	....	25	500
Lake	....	....	10,830	26,000	75,315	236	2,960
Lassen	....	....	47,895	7,340	51,485	12	560
Los Angeles	....	....	33,000	9,300	1,436,000	2,720	163,200
Marin	....	....	2,312,493	43,000	6,413	....	....
Mariposa	....	....	....	....	....	....	....
Mendocino	....	....	....	....	....	....	....
Merced	....	120,000	27,716	43,200	27,716	156	2,500
Mono	....	....	12,310	1,500	....	....	....
Monterey	....	....	28,720	15,110	....	....	....
Napa	....	....	138,300	15,400	75,130	320	2,600
Nevada	....	....	25,000	50	3,000	488	5,000
Placer	....	....	7,000	2,500	100,500	380	1,050
Plumas	....	....	224,950	....	10,165	100	1,655
Sacramento	....	....	229,420	71,675	346,200	426	2,585
San Bernardino	....	....	20,000	2,500	85,000	884	10,000
San Diego	....	....	5,965	1,200	86,700	1,854	31,215
San Francisco	....	....	....	....	....	....	....
San Joaquin	....	....	175,000	10,000	274,265	1,675	4,500
San Luis Obispo	....	....	82,900	88,390	811,932	657	1,000
San Mateo	....	....	138,253	275,617	....	213	950
Santa Barbara	....	....	1,400	17,000	1,397,380	107	1,000
Santa Clara	....	....	83,825	492,376	98,347	128	2,633
Santa Cruz	....	....	131,456	26,530	650	....	....
Shasta	....	....	15,250	....	125,000	531	4,330
Sierra	....	....	91,000	12,700	3,874	154	3,700
Siskiyou	....	....	77,964	18,114	....	680	6,944
Solano	....	....	31,560	750	29,765	63	2,325
Sonoma	....	....	443,680	37,200	52,750	235	412
Stanislaus	....	....	6,650	....	637,400	285	7,400
Sutter	....	....	65,075	....	135,973	1,785	1,285
Tehama	....	....	....	....	....	....	....
Trinity	....	....	15,000	700	....	69	200
Tulare	....	....	5,000	....	722,115	557	6,340
Tuolumne	....	....	80,000	....	9,000	434	4,000
Ventura	....	....	....	....	....	....	....
Yolo	....	....	131,000	3,000	50,160	473	5,231
Yuba	....	....	40,000	....	100,000	150	800
Totals	187	148,084	5,321,469	1,343,782	10,757,004	18,506	301,516

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of apple trees	Number of peach trees	Number of pear trees	Number of plum trees	Number of cherry trees	Number of nectarine trees	Number of quince trees	Number of apricot trees
Alameda	52,790	13,507	16,690	14,559	25,879	1,422	1,289	6,308
Alpine	100	50	....	....	....	....	....	....
Amador	35,670	19,480	11,320	3,270	1,740	820	935	2,473
Butte	34,280	31,540	6,210	4,670	1,860	1,100	638	2,370
Calaveras	27,303	12,107	3,934	2,483	547	389	778	568
Colusa	71,450	90,645	15,000	9,450	8,500	3,400	3,000	4,240
Contra Costa	36,798	16,630	8,252	4,810	3,133	416	1,635	1,076
Del Norte	7,051	200	316	345	262	10	17	12
El Dorado	81,581	25,591	22,913	8,375	1,511	892	424	196
Fresno	2,332	4,564	472	320	103	51	34	184
Humboldt	62,470	2,000	1,700	2,460	1,506	....	120	100
Inyo	500	1,500	200	100	75	50	40	42
Kern	2,997	3,833	580	606	249	335	252	237
Klamath	4,000	2,000	200	450	170	70	40	35
Lake	9,784	4,223	1,748	1,350	223	122	36	150
Lassen	7,831	3,069	579	456	115	31	98	204
Los Angeles	7,400	13,000	5,000	250	150	430	1,100	2,000
Marin	29,392	316	971	763	314	17	168	17
Mariposa	....	....	....	....	....	....	....	....
Mendocino	....	....	....	....	....	....	....	....
Merced	10,732	6,738	1,754	865	316	82	155	640
Mono	....	....	....	....	....	....	....	....
Monterey	5,780	2,100	1,850	840	380	90	120	280
Napa	63,420	24,270	20,460	7,230	13,115	9,240	1,610	1,995
Nevada	56,753	21,509	8,169	4,999	3,285	722	1,285	255
Placer	48,905	24,108	11,879	14,309	7,907	1,143	1,979	809
Plumas	3,066	3,429	594	232	400	34	9	11
Sacramento	99,556	100,002	32,116	19,214	6,829	3,625	3,699	13,565
San Bernardino	11,500	13,000	1,510	1,400	75	225	375	1,565
San Diego	1,634	6,152	348	700	635	126	63	136
San Francisco	....	....	....	....	....	....	....	....
San Joaquin	40,000	18,000	12,000	6,000	1,000	1,000	750	2,500
San Luis Obispo	4,000	1,100	1,200	550	200	100	60	120
San Mateo	11,004	2,248	2,111	1,008	715	147	220	671
Santa Barbara	5,646	1,589	1,525	853	174	114	285	1,694
Santa Clara	104,372	45,836	36,117	30,412	19,397	1,518	2,195	3,749
Santa Cruz	33,150	5,200	3,470	4,825	1,485	98	238	656
Shasta	84,250	64,866	8,760	4,542	786	715	410	530
Sierra	8,470	5,110	1,036	410	490	105	138	40
Siskiyou	51,614	6,213	1,866	983	309	123	83	113
Solano	17,470	10,860	4,413	4,160	6,935	1,083	1,360	27,513
Sonoma	487,955	171,921	35,893	45,182	20,431	1,710	6,636	4,345
Stanislaus	4,500	6,750	1,500	800	450	....	50	750
Sutter	25,000	18,186	6,211	2,949	1,843	1,175	975	3,165
Tehama	....	....	....	....	....	....	....	....
Trinity	13,470	4,860	1,775	1,163	320	115	54	35
Tulare	19,217	23,240	4,663	2,174	890	450	340	1,840
Tuolumne	70,000	85,000	18,000	13,000	7,000	4,500	2,000	2,500
Ventura	....	....	....	....	....	....	....	....
Yolo	38,164	21,274	6,973	3,348	3,722	1 462	1,972	5 072
Yuba	35,530	18,590	6,741	4,242	1,200	1,000	2,136	3,716
Totals	1,828,887	956,386	328,719	231,107	146,626	40,247	39,801	98,477

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of fig trees..	Number of lemon trees	Number of orange trees	Number of olive trees	Number of prune trees	Number of mulberry trees	Number of almond trees........	Number of walnut trees ....
Alameda	613	25	67	540	2,728	125	55,385	1,382
Alpine								
Amador	1,079	41	154	16	172	8,386	1,075	483
Butte	2,650	480	800	150	275	2,500	2,400	1,420
Calaveras	1,630	4	77	4	71	502	220	156
Colusa	5,620	50	250		15	300	3,000	450
Contra Costa	841	22	75	83	169	6,311	670	2,966
Del Norte								10
El Dorado	579						133	
Fresno	431	18	129		21	54	149	219
Humboldt	20					20	20	52
Inyo	12					40		50
Kern	404	172	193	168	153	367	337	486
Klamath							6	
Lake	64				22	5,007	257	122
Lassen							5	117
Los Angeles	2,100	4,900	34,700	2,000	120	120,000	780	5,300
Marin	78					11	29	218
Mariposa								
Mendocino								
Merced	980	15	40	25	82	680	236	199
Mono								
Monterey	120		25	70		50	65	125
Napa	915	55	90	635	430	40,270	4,130	1,265
Nevada	843		6		102	52,926	199	455
Placer	2,521	15	75	140	387	46,988	859	547
Plumas	3						5	1
Sacramento	4,670	841	999	128	1,026	46,804	4,525	49,274
San Bernardino	1,120	1,268	27,000	110	114	419	300	10,000
San Diego	610	760	1,807	288	38	124	473	147
San Francisco								
San Joaquin	2,500	50	50	25	275	550	300	500
San Luis Obispo	250	50	75	1,200	100	75	100	50
San Mateo	207	33	139	120	194	14,247	400	733
Santa Barbara	662	422	368	4,445	56	1,103	62,143	6,613
Santa Clara	1,438	1,029	3,073	1,126	6,531	1,672	2,896	2,687
Santa Cruz	264		7	8	162		120	474
Shasta	725	6	18		8	125	150	325
Sierra	12	2	1		28	20	38	105
Siskiyou						9,214		
Solano	3,512		178	65	273		5,080	1,742
Sonoma	4,716	229	1,172	3	340	7,201	6,042	14,442
Stanislaus	950		12			40	150	
Sutter	1,975	95	110	10	178	4,825	725	1,585
Tehama								
Trinity							2	14
Tulare	1,975	116	145	17	41	900	250	400
Tuolumne	1,800					700	130	
Ventura								
Yolo	3,432	32	232	23	301	33,460	4,960	3,776
Yuba	2,000	30	200	25	230	600	8,500	500
Totals	54,321	10,760	72,247	11,424	14,642	406,626	167,240	109,380

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of grape vines	Gallons of wine	Gallons of brandy	DISTILLERIES.		BREWERIES.	
				Number	Gallons	Number	Gallons
Alameda	321,390	50,225	10,000			9	211,670
Alpine						1	1,500
Amador	1,680,000	35,700	1,250			4	60,000
Butte	620,000	24,300	3,400	2	16,000	3	20,000
Calaveras	558,054	80,191	1,717	18	1,080	6	28,735
Colusa	250,000					1	20,000
Contra Costa	478,267	89,190		1		1	
Del Norte	200					1	7,500
El Dorado	1,444,950	103,060	3,320	6		4	
Fresno	20,832						
Humboldt	3,335					2	
Inyo	10,000					2	12,000
Kern	25,547		440			3	8,000
Klamath	2,000	1,000					
Lake	46,735						
Lassen	2,986						
Los Angeles	4,220,000	1,508,000	60,100	43	68,700	2	35,000
Marin	9,654	1,623					
Mariposa							
Mendocino							
Merced	183,076	7,670	73	1			
Mono						1	1,300
Monterey	102,000	9,000	400	1	400	4	
Napa	2,962,315	423,125	5,718	7		2	
Nevada	340,504	19,464	3,066	12	3,066	15	126,147
Placer	785,975	49,581	4,550	12		7	96,000
Plumas	250					3	4,550
Sacramento	2,288,120	240,702	24,180	17	24,180	8	273,000
San Bernardino	425,000	100,000	4,000	5	4,000	1	6,000
San Diego	86,244	2,000				2	15,000
San Francisco				3	750,000	38	6,600,000
San Joaquin	1,000,000	70,000				3	46,000
San Luis Obispo	55,000	400				1	12 958
San Mateo	40,094					2	33,000
Santa Barbara	115,733	11,650		2		1	5,000
Santa Clara	1,182,093	117,963	97,672	5	29,176	5	2,500,000
Santa Cruz	251,275	68,500	900	2	900	4	34,120
Shasta	495,354	31,450	800	2	800	1	12,000
Sierra	15,600	1,560				7	3,400
Siskiyou	83,705	458				5	35,330
Solano	1,063,714	138,742	5,040	9	1,200	4	113,850
Sonoma	3,450,938	655,632	21,831	1		4	45,800
Stanislaus	225,000	50,500	1,500	1	3,000	1	7,560
Sutter	668,190	58,000	7,085	2	7,085	1	1,780
Tehama							
Trinity	18,640	560		1	300	2	10,000
Tulare	276,480	1,200		3		3	11,550
Tuolumne	1,700,000	90,000	2,263	10		4	42,720
Ventura							
Yolo	493,264	18,180	1,970	3		3	39,373
Yuba	480,000	46,675	13,080	4		1	
Totals	28,482,514	4,106,301	274,355	171	909,887	172	10,480,843

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of horses...	Number of mules...	Number of asses....	Number of cows.....	Number of calves...	Number of beef cattle................	Number of oxen.....	Total number of neat cattle.........
Alameda	7,965	672	8	6,001	5,735	1,837	241	13,814
Alpine	112	14	....	234	212	182	68	696
Amador	3,152	209	7	2,872	1,540	3,652	116	8,180
Butte	5,174	825	41	3,072	1,973	11,288	284	16,617
Calaveras	3,169	218	22	4,150	2,786	3,435	142	10,513
Colusa	7,310	1,296	24	2,142	1,225	6,705	25	10,097
Contra Costa	5,315	576	12	7,869	4,279	5,900	2	18,050
Del Norte	666	112	....	962	730	713	70	2,475
El Dorado	1,448	107	12	3,817	1,060	3,861	167	8,905
Fresno	4,997	413	38	22,414	4,292	2,310	83	29,099
Humboldt	6,638	869	27	12,250	10,470	5,719	150	28,589
Inyo	3,349	614	56	1,054	1,597	424	196	13,520
Kern	4,916	1,339	118	1,263	165	2,983	266	39,789
Klamath	500	400	1	900	600	1,800	100	3,400
Lake	1,224	259	5	1,895	1,554	886	48	4,383
Lassen	4,198	176	....	13,589	6,553	6,876	174	27,193
Los Angeles	12,000	2,000	170	4,130	3,000	8,900	280	16,310
Marin	2,261	101	....	19,731	6,665	374	262	34,251
Mariposa	....	....	....	....	....	....	....	....
Mendocino	....	....	....	....	....	....	....	....
Merced	4,787	843	4	1,206	1,611	6,506	539	9,862
Mono	1,307	95	6	6,348	3,785	277	83	10,493
Monterey	8,133	404	15	49,221	11,467	2,351	11	63,050
Napa	5,278	565	17	3,053	6,000	2,339	32	11,424
Nevada	2,633	111	3	2,761	1,566	2,935	292	7,554
Placer	2,622	283	14	2,720	1,343	2,113	411	6,207
Plumas	1,856	143	13	5,076	4,814	963	224	11,077
Sacramento	9,139	294	9	7,803	7,249	2,533	199	17,784
San Bernardino	3,913	233	15	1,731	705	175	79	8,633
San Diego	5,570	556	31	2,380	2,673	8,100	162	13,215
San Francisco	....	....	....	....	....	....	....	....
San Joaquin	9,201	914	18	5,037	5,131	8,538	26	18,732
San Luis Obispo	5,000	360	40	7,205	16,036	1,986	28	60,978
San Mateo	3,666	304	....	6,950	4,020	3,619	202	14,791
Santa Barbara	4,396	284	13	8,626	3,433	15,145	48	27,252
Santa Clara	10,186	547	25	11,167	4,807	11,228	39	40,471
Santa Cruz	3,565	164	3	4,108	1,783	235	610	6,736
Shasta	2,747	226	18	4,849	3,400	2,175	155	10,579
Sierra	894	119	....	1,280	1,094	1,116	152	3,642
Siskiyou	7,020	824	45	22,011	12,704	19,056	200	53,971
Solano	6,760	764	8	4,612	3,340	4,670	....	12,622
Sonoma	10,979	818	17	18,018	17,542	1,172	307	37,039
Stanislaus	7,607	1,196	17	4,430	3,190	....	....	7,620
Sutter	5,603	508	2	3,075	5,489	2,570	55	11,189
Tehama	....	....	....	....	....	....	....	....
Trinity	868	350	4	547	413	2,388	78	3,426
Tulare	7,709	454	64	16,189	8,621	7,812	187	32,809
Tuolumne	2,750	187	29	2,501	319	4,058	102	6,980
Ventura	....	....	....	....	....	....	....	....
Yolo	6,534	896	4	6,434	1,483	33	....	8,215
Yuba	3,446	349	8	4,879	1,906	3,786	110	10,681
Totals	214,463	23,071	882	322,562	190,390	174,624	7,005	814,212

TABLE OF STATISTICS—Continued.

COUNTIES.	Number of sheep...	Number of Cashmere and Angora goats.........	Number of hogs.....	Number of chickens	Number of turkeys.	Number of geese....	Number of ducks...	Number of hives of bees ....
Alameda	27,883	5	4,445					
Alpine	330		78					
Amador	18,826		3,737					
Butte	65,891	205	13,225					
Calaveras	35,316	3,134	4,053					
Colusa	174,107	2	17,637					
Contra Costa	13,270	31	4,352					
Del Norte	400		758					
El Dorado	13,417	280	22,074					
Fresno	281,808	2,436	8,474					
Humboldt	38,777	14	7,204					
Inyo	5,446		1,220					
Kern	127,020		2,616					
Klamath			900					
Lake	16,622		4,192					
Lassen	20,093		981					
Los Angeles	478,700	110	5,800					
Marin	2,039		784					
Mariposa								
Mendocino								
Merced	266,599		3,916					
Mono	1,992		280					
Monterey	256,022	95	10,512					
Napa	23,035		3,408					
Nevada	2,182	1,373	2,217					
Placer	40,451	66	3,615					
Plumas	4,000	487	715					
Sacramento	150,572	764	4,722					
San Bernardino	49,297	322	1,480					
San Diego	52,915	892	1,270					
San Francisco								
San Joaquin	57,938	13	1,300					
San Luis Obispo	202,983	1,275	4,445					
San Mateo	843		3,163					
Santa Barbara	231,773	60	1,725					
Santa Clara	41,282	1,239	7,013					
Santa Cruz	553		2,435					
Shasta	38,734	2	7,152					
Sierra	1,892	5	1,110					
Siskiyou	25,712		1,619					
Solano	36,727		6,299					
Sonoma	93,594	936	14,279					
Stanislaus	134,505							
Sutter	29,234		3,194					
Tehama								
Trinity	13,330		590					
Tulare	178,078	1,700	7,518					
Tuolumne	15,113	2,859	1,930					
Ventura								
Yolo	33,440		12,394					
Yuba	34,334	2	4,700					
Totals	3,337,155	18,307	215,531					

TABLE OF STATISTICS—Continued.

COUNTIES.	GRIST MILLS.				Barrels of flour made.	Bushels of corn ground	SAW MILLS.		Feet of lumber sawed	Number of shingles made
	Steam power.	Run of stone.	Water power.	Run of stone.			Steam power.	Water power.		
Alameda	3	9	1	2	26,660	1,900				
Alpine							2	2	1,300,000	500,000
Amador	1	3	1	2	4,280	19,028	3		3,000,000	473,000
Butte	1	4	3	7	83,000	10,000	17	2	16,000,000	1,500,000
Calaveras							4	2	2,962,000	3,862,500
Colusa	3	6			15,000	1,000	2		2,000,000	20,000
Contra Costa	4	11								
Del Norte	1	1	1	2	500	50	2	5	9,000,000	100,000
El Dorado			1	2			8	4	1,282,900	
Fresno			1	2	75		2		250,000	
Humboldt	1	1	2	2	4,200	700	8	2	43,000,000	10,500,000
Inyo			2	6	5,000	11,961		3	1,210,000	200,000
Kern			3	6	8,000	2,000	2	3	4,000,000	40,000
Klamath							2	9	3,500,000	40,000
Lake	2	3	1	2	6,000	1,200	6	2	1,856,000	95,000
Lassen			2	3	2,970	100	1	2	2,750,000	98,000
Los Angeles			5	10	3,800	46,000	2		20,000	
Marin										
Mariposa										
Mendocino										
Merced			2	5						
Mono			1	2	500	200	2	3	400,000	50,000
Monterey	4	7								
Napa	2	6	2	3	11,875	9,780	1		17,000	
Nevada	1	4			13,000	1,500	18	7	45,000,000	14,438,000
Placer	1	3			21,000	1,800	16	5	20,500,000	1,900,000
Plumas	1	2			70		4	5	4,000,000	
Sacramento	4	19	1	1	186,700	33,670	3			
San Bernardino			4	8	8,500	8,000	5		2,800,000	250,000
San Diego	1	3			1,600	800	1	1	375,000	50,000
San Francisco	12				479,000					
San Joaquin	4	17			77,000	6,000				
San Luis Obispo	1	1	3	6	5,000	2,500	1		500,000	
San Mateo	2	5			3,000		14	1	740,084	37,883,000
Santa Barbara	1	2			1,000	3,000				
Santa Clara	7	22	2	7	63,345	2,932	3	2	18,009,865	
Santa Cruz	3	7	2	5	22,130	4,105	13	5	8,700,000	6,500,000
Shasta			2	4	7,500	1,425	1	14	6,500,000	
Sierra			1	2	254		11	8	6,300,000	34,000
Siskiyou	2	4	7	10	19,479	3,500	4	13	3,500,000	1,000,000
Solano	3	10								
Sonoma	8	15	5	7	21,200	8,400	8		6,300,000	
Stanislaus	1	3	1	3	15,000	5,000				
Sutter	1	1			10,000	600				
Tehama										
Trinity			1	1			1	9	1,200,000	
Tulare	1	3	2	4	12,863	1,100	3	1	3,700,000	325,000
Tuolumne			4	8	13,000	21,000	5	2	5,000,000	180,000
Ventura										
Yolo	3	9			52,700	963	2			
Yuba	3	12	1	3	100,000	20,000	7	4	3,000,000	
Totals	72	193	64	125	1,305,201	230,214	184	116	228,672,849	80,038,500

TABLE OF STATISTICS—Continued.

COUNTIES.	QUARTZ MILLS.		MINING DITCHES.			IRRIGATING DITCHES.		WOOLEN MILLS.		COTTON MILLS.		COAL.	RAILROADS.	
	Number	Tons crushed.	Number	Miles in length	Am't of water used per day—inches	Number	Acres irrigated	Number	Pounds of wool used	Number	Pounds of cotton used.	Tons mined	Number	Miles in length
Alameda													3	95
Alpine	5					2	2,000							
Amador	15	81,000	9	148	12,000							5,360		
Butte	8	10,000	11	285	5,000	7	3,300						2	58
Calaveras	34	28,960	22	490	3,670								1	$\frac{50}{100}$
Colusa														
Contra Costa												140,000	2	$11\frac{50}{100}$
Del Norte			30	114	2,200	4	130						2	4
El Dorado	40		54	850	6,720	20	1,320							$18\frac{75}{100}$
Fresno			3	5		7	170						1	61
Humboldt													1	2
Inyo	3	5,000	4	50	10,000	5	6,000							
Kern	15													
Klamath	3	10,000	70	90	15,000	6	400						2	2
Lake						1	5							
Lassen	1	200	5	12	700	3	1,300							
Los Angeles	1	5,000	4	21	2,860	52	22,900	1					1	$20\frac{50}{100}$
Marin													1	$3\frac{50}{100}$
Mariposa														
Mendocino														
Merced													*1*	*$36\frac{78}{100}$*
Mono	*3*	*1,400*	*1*	*4*	*300*									
Monterey													1	71
Napa													2	41
Nevada			76	707	38,000								1	$30\frac{25}{100}$
Placer	14	22,750	53	417	14,110	6	1,750						2	$112\frac{75}{100}$
Plumas	8	33,500	30	200	20,000									
Sacramento			5	97	5,700	2	37	1	280,000				4	63
San Bernardino	2		1	4	130	11	3,500							
San Diego	7	10,500											1	2
San Francisco								2	4,000,000				1	12
San Joaquin						2	4,500	1	100,000				4	$94\frac{50}{100}$
San Luis Obispo														
San Mateo													1	25
Santa Barbara														
Santa Clara						5	872	2	168,750				4	$72\frac{25}{100}$
Santa Cruz													1	$2\frac{25}{100}$
Shasta	2	500	78	325	11,650	73	2,100						1	$18\frac{80}{100}$
Sierra	24	68,000	50	213	2,800	24	600							
Siskiyou	3	1,000	18	220	9,000	260	35,000							
Solano													2	$45\frac{50}{100}$
Sonoma													1	56
Stanislaus			2	14	500		350						3	33
Sutter						1	360						2	34
Tehama														
Trinity			225	422	46,950									
Tulare	2	500				19	7,400						1	$33\frac{25}{100}$
Tuolumne	23	12,000	4	100	2,400	100	5,500							
Ventura														
Yolo						2	7,000						2	32
Yuba			20	75	4,500	10	800	1	260,000				2	$25\frac{87}{100}$
Totals	213	290,310	775	4,863	214,190	622	116,294	8	4,808,750			145,360		$1,117\frac{95}{100}$

TABLE OF STATISTICS—Continued.

COUNTIES.	ASSESSED VALUE OF PROPERTY—1873. Real estate...	Improvem'ts	Personal property...	Total valuation..........	Estimated total population	Registered voters...	Poll tax collected in 1872....................
Alameda	24,997,305	5,616,365	4,314,695	34,928,365	39,500	6,304	13,592
Alpine	258,085	12,900	326,410	597,395	1,050	350	361
Amador	1,239,940	711,080	739,220	2,690,240	10,500	3,176	3,600
Butte	4,587,738	1,554,762	1,650,997	7,793,497	15,000	3,962	4,308
Calaveras	370,813	472,354	715,639	1,558,806	9,500	2,728	1,406
Colusa	5,759,731	489,710	1,890,269	8,139,710	13,000	2,500	1,600
Contra Costa	4,854,190	821,818	1,328,453	7,004,461	10,300	2,670	4,733
Del Norte	207,790	198,205	233,850	639,845	2,300	492	1,240
El Dorado	479,471	777,315	864,245	2,121,031	9,220	2,800	2,844
Fresno	3,915,733	516,326	2,116,534	6,548,593	7,300	950	1,455
Humboldt	1,619,702	748,495	1,304,529	3,672,726	11,600	2,484	3,028
Inyo	291,279	255,617	851,392	1,398,288	2,500	782	700
Kern	1,391,718	238,321	1,328,637	2,958,676	5,000	866	854
Klamath	272,219	107,712	183,864	563,795	1,800	415	809
Lake	876,325	342,478	452,420	1,671,223	3,200	1,140	1,400
Lassen	218,810	158,121	826,205	1,203,136	1,700	913	384
Los Angeles	5,367,505	1,829,020	2,658,068	9,854,593	19,200	5,434	4,450
Marin	5,914,211	1,217,255	1,306,707	8,438,173	9,000	1,698	3,108
Mariposa	....	....	....	....	....	....	....
Mendocino	....	....	....	....	....	....	....
Merced	4,143,855	437,505	1,557,843	6,139,203	3,500	1,520	716
Mono	70,330	98,845	285,084	454,259	600	261	269
Monterey	7,355,739	904,859	3,130,166	11,390,764	10,500	4,000	1,480
Napa	4,469,175	1,848,570	1,276,240	7,593,985	13,455	2,990	3,988
Nevada	4,275,922	1,547,742	1,516,000	7,339,664	19,500	6,598	7,760
Placer	3,339,953	400,555	1,732,407	5,472,915	....	3,597	3,667
Plumas	894,508	443,796	536,364	1,874,668	4,500	1,300	1,350
Sacramento	8,867,561	6,678,885	5,365,786	20,912,232	36,000	7,000	11,208
San Bernardino	754,102	255,797	389,478	1,399,377	7,250	1,650	664
San Diego	2,040,222	252,245	607,306	2,899,773	9,600	2,255	728
San Francisco	131,417,024	38,087,105	46,205,649	215,709,778	175,000	42,642	47,000
San Joaquin	10,768,562	3,980,684	3,482,321	18,231,567	25,000	5,000	7,162
San Luis Obispo	2,404,863	316,133	1,326,062	4,047,058	6,500	2,100	1,400
San Mateo	7,515,665	1,247,340	951,930	9,714,935	7,500	1,750	2,910
Santa Barbara	3,057,012	572,240	1,461,360	5,090,612	10,000	1,350	1,500
Santa Clara	18,484,023	5,532,327	7,306,076	31,322,426	28,500	7,928	17,003
Santa Cruz	3,839,458	1,217,656	1,094,094	6,151,208	9,000	2,843	4,698
Shasta	500,320	375,389	895,868	1,771,577	6,200	1,680	3,033
Sierra	883,370	650,998	471,074	2,005,442	5,200	2,100	2,300
Siskiyou	1,080,728	560,235	2,053,430	3,694,393	8,000	2,751	1,845
Solano	6,302,902	1,768,929	1,863,784	9,935,615	....	5,620	9,300
Sonoma	9,408,462	3,142,855	2,949,178	15,500,495	26,500	....	7,200
Stanislaus	4,124,098	813,882	1,407,217	6,345,197	7,000	2,174	1,114
Sutter	2,751,077	491,636	962,719	4,205,432	6,825	1,415	2,150
Tehama	....	....	....	....	....	....	....
Trinity	373,994	235,292	90,328	699,614	3,300	904	1,517
Tulare	1,277,535	670,022	1,514,338	3,461,895	8,000	1,500	2,296
Tuolumne	166,635	174,185	566,845	907,665	7,500	2,800	2,000
Ventura	....	....	....	....	....	....	....
Yolo	5,226,099	998,353	1,900,923	8,125,375	11,000	5,245	1,666
Yuba	1,692,415	1,626,220	1,570,435	4,889,070	11,000	3,591	6,800
Totals	310,108,175	91,398,134	117,562,439	519,068,747	638,600	164,218	204,596

ADDITIONAL STATISTICS.

[The statistical reports from Mariposa, Mendocino, Tehama, and Ventura Counties were not received until after the Surveyor General's Report was forwarded to the Governor.]

ADDITIONAL STATISTICS

FROM

REPORTS OF COUNTY ASSESSORS.

STATISTICS,

January first, eighteen hundred and seventy-two, to January first, eighteen hundred and seventy-three, compiled from the books of the Assessor of Mariposa County.

AGRICULTURAL PRODUCTS.	Number.
Land inclosed in eighteen hundred and seventy-two, acres	2,350
Land cultivated in eighteen hundred and seventy-two, acres	6,500
Wheat, acres	730
Wheat, bushels	5,000
Barley, acres	2,000
Barley, bushels	6,000
Oats, acres	3,300
Oats, bushels	....
Rye, acres	30
Rye, bushels	....
Corn, acres	40
Corn, bushels	500
Buckwheat, acres	....
Buckwheat, bushels	....
Peas, acres	....
Peas, bushels	....
Peanuts, acres	....
Peanuts, pounds	....
Beans, acres	5
Beans, bushels	100
Castor beans, acres	....
Castor beans, pounds	....
Potatoes, acres	70
Potatoes, bushels	200
Sweet potatoes, acres	....
Sweet potatoes, tons	....
Onions, acres	10

AGRICULTURAL PRODUCTS—Continued.

AGRICULTURAL PRODUCTS.	Number.
Sweet potatoes, acres	....
Sweet potatoes, tons	....
Onions, acres	....
Onions, bushels	....
Hay, acres	7,340
Hay, tons	10,303
Flax, acres	....
Flax, pounds	....
Hops, acres	100
Hops, pounds	80,000
Tobacco, acres	....
Tobacco, pounds	....
Cotton, acres	....
Cotton, pounds	....
Butter, pounds	70,000
Cheese, pounds	3,000
Wool, pounds	600,000
Honey, pounds	....

FRUIT TREES AND VINES.	Number.
Apple trees	12,748
Peach trees	4,778
Pear trees	840
Plum trees	1,696
Cherry trees	450
Nectarine trees	350
Quince trees	78
Apricot trees	175
Fig trees	50
Lemon trees	....
Almond trees	29
Walnut trees	75
Grapevines	28,668
Wine, gallons	....
Brandy, gallons	....
Distilleries (not in operation)	2
Gallons	....
Breweries	5
Gallons	14,400

MISCELLANEOUS.	Number.	Value.
Acres of wheat sown in 1873	500	....
Acres of barley sown in 1873	1,600	....
Acres of potatoes planted in 1873	50	....
Acres of oats sown in 1873	250	....
Assessed value of real estate in 1873	....	$445,780 00
Assessed value of improvements on same	....	375,823 00
Assessed value of personal property in 1873	....	550,367 00
Estimated total population in 1873	4,000	....
Registered voters in 1873	1,421	....
Poll tax collected in 1872	691	....

I hereby certify that the above statement is true and correct.

WM. F. COFFMAN,
Assessor Mariposa County.

STATISTICS,

January first, eighteen hundred and seventy-two, to January first, eighteen hundred and seventy-three, compiled from the books of the Assessor of Mendocino County.

AGRICULTURAL PRODUCTS.	Number.
Land inclosed in 1872, acres	76,451
Land cultivated in 1872, acres	18,747
Wheat, acres	4,285
Wheat, bushels	80,675
Barley, acres	2,950
Barley, bushels	86,610
Oats, acres	1,231
Oats, bushels	31,390
Corn, acres	475
Corn, bushels	8,050
Buckwheat, acres	....
Buckwheat, bushels	....
Peas, acres	....
Peas, bushels	....
Peanuts, acres	....
Peanuts, pounds	....
Beans, acres	....
Beans, bushels	....
Castor beans, acres	....
Castor beans, pounds	....
Potatoes, acres	650
Potatoes, tons	1,785

AGRICULTURAL PRODUCTS—Continued.

AGRICULTURAL PRODUCTS.	Number.
Sweet potatoes, acres	....
Sweet potatoes, tons	....
Onions, acres	....
Onions, bushels	....
Hay, acres	7,340
Hay, tons	10,303
Flax, acres	....
Flax, pounds	....
Hops, acres	100
Hops, pounds	80,000
Tobacco, acres	....
Tobacco, pounds	....
Cotton, acres	....
Cotton, pounds	....
Butter, pounds	70,000
Cheese, pounds	3,000
Wool, pounds	600,000
Honey, pounds	....

FRUIT TREES AND VINES.	Number.
Apple trees	12,748
Peach trees	4,778
Pear trees	840
Plum trees	1,696
Cherry trees	450
Nectarine trees	350
Quince trees	78
Apricot trees	175
Fig trees	50
Lemon trees	....
Almond trees	29
Walnut trees	75
Grapevines	28,668
Wine, gallons	....
Brandy, gallons	....
Distilleries (not in operation)	2
Gallons	....
Breweries	5
Gallons	14,400

LIVE STOCK.	Number.
Horses	7,052
Mules	743
Asses	19
Stock cattle	6,600
Cows (two years old and over)	4,300
Calves (under two years old)	9,448
Beef cattle (steers two years old and over)	4,490
Oxen	357
Total number of cattle	25,195
Sheep	166,686
Cashmere and Angora goats	318
Hogs (one year old and over)	7,432
Hives of bees	394

IMPROVEMENTS.	Number.
Grist mills	7
Steam power	4
Run of stone	5
Water power	3
Run of stone	3
Barrels of flour made (not reported)	
Bushels of corn ground (not reported)	
Sawmills	18
Steam power	14
Water power	4
Lumber sawed, feet (estimated)	50,000,000
Shingles made	2,000,000
Quartz mills	
Tons of quartz crushed	
Mining ditches	
Miles in length	
Average amount of water used daily, inches	
Railroad ties	500,000
Irrigating ditches	
Acres irrigated	
Woolen mills	
Pounds of wool used	
Cotton mills	
Pounds of cotton used	
Tons of coal mined	

MISCELLANEOUS.	Number.	Value.
Acres of wheat sown in 1873	5,370	
Acres of barley sown in 1873	3,400	
Acres of potatoes planted in 1873	800	
Acres of oats sown in 1873	4,050	
Assessed value of real estate in 1873		$2,074,149 00
Assessed value of improvements on, in 1873		896,724 00
Assessed value of personal property in 1873		1,977,250 00
Estimated total population in 1873	9,000	
Registered voters in 1873	2,906	
Poll tax collected in 1872	2,622	
Money assessed		65,310 00

I hereby certify that the above statement is true and correct.

J. H. DONOHOE,
Assessor Mendocino County.

STATISTICS.

January first, eighteen hundred and seventy-three, to January first, eighteen hundred and seventy-four, compiled from the books of the Assessor of Tehama County.

RED BLUFF, September 29th, 1873.

HON. ROBERT GARDNER,
Surveyor General:

DEAR SIR: Have been exceedingly unwell. Received, for the first time, your letter dated the eighth of September; it has been lying here. Please excuse delay.

J. L. JACKMAN,
Assessor of Tehama County.

AGRICULTURAL PRODUCTS.	Number.
Land inclosed in 1873, acres	125,000
Land cultivated in 1873, acres	45,000
Wheat, acres	23,000
Wheat, bushels	506.000
Barley, acres	1,600
Barley, bushels	348,000
Oats, acres	200

AGRICULTURAL PRODUCTS—Continued.

AGRICULTURAL PRODUCTS.	Number.
Oats, bushels	8,000
Rye, acres	
Rye, bushels	
Corn, acres	100
Corn, bushels	2,000
Buckwheat, acres	
Buckwheat, bushels	
Peas, acres	5
Peas, bushels	100
Peanuts, acres	40
Peanuts, pounds	16,000
Beans, acres	20
Beans, bushels	800
Castor beans, acres	
Castor beans, pounds	
Potatoes, acres	40
Potatoes, tons	4
Sweet potatoes, acres	30
Sweet potatoes, tons	3
Onions, acres	11
Onions, bushels	4,000
Hay, acres	4,000
Hay, tons	7,000
Flax, acres	
Flax, pounds	
Hops, acres	
Hops, pounds	
Tobacco, acres	
Tobacco, pounds	
Cotton, acres	
Cotton, pounds	
Beets, tons	3
Turnips, tons	7
Pumpkins and squashes, tons	20
Silk cocoons, pounds	
Broomcorn, acres	25
Butter, pounds	10,000
Cheese, pounds	1,600
Wool, pounds	1,467,900
Honey, pounds	1,200

FRUIT TREES AND VINES.	Number.
Apple trees	10,000
Peach trees	29,350
Pear trees	23,000
Plum trees	1,900
Cherry trees	250
Nectarine trees	1,100
Quince trees	175
Apricot trees	1,580
Fig trees	800
Lemon trees	4
Orange trees	3
Olive trees	
Prune trees	38
Mulberry trees	60
Almond trees	44
Walnut trees	88
Grapevines	500,000
Wine, gallons	74,000
Brandy, gallons	800
Distilleries	1
Gallons	800
Breweries	1
Gallons	5,000

LIVE STOCK.	Number.
Horses	4,044
Mules	400
Asses	4
Cows (two years old and over)	3,000
Calves (under two years old)	1,500
Beef cattle (steers two years old and over)	
Oxen	60
Total number of cattle	11,460
Sheep	293,580
Cashmere and Angora goats	200
Hogs (one year old and over)	3,531
Hives of bees	120

IMPROVEMENTS.	Number.
Grist mills	3
Steam power	
Run of stone	
Water power	3
Run of stone	12
Barrels of flour made	75,000
Bushels of corn ground	1,700
Sawmills	6
Steam power	4
Water power	2
Lumber sawed, feet	6,000,000
Shingles made	1,500,000
Quartz mills	
Tons of quartz crushed	
Mining ditches	
Miles in length	
Average amount of water used daily, inches	
Irrigating ditches	12
Acres irrigated	900
Woolen mills	
Pounds of wool used	
Cotton mills	
Pounds of cotton used	
Tons of coal mined	
Railroads	1
Miles in length, 40½; value	$257,940

MISCELLANEOUS.	Number.	Value.
Land under cultivation in 1873, acres	45,000	
Acres of wheat sown in 1873	23,000	
Acres of barley sown in 1873	16,000	
Acres of potatoes planted in 1873	40	
Acres of oats sown in 1873	200	
Assessed value of real estate in 1873		$148,007
Assessed value of improvements on same		1,277,922
Assessed value of personal property in 1873		1,106,021
Estimated total population in 1873	6,000	
Registered voters in 1873	1,635	
Poll tax collected in 1872	800	

I hereby certify that the above statement is true and correct.

J. L. JACKMAN,
Assessor Tehama County.

STATISTICS,

January first, eighteen hundred and seventy-two, to January first, eighteen hundred and seventy-three, compiled from the books of the Assessor of Ventura County.

San Buenaventura, September 24th, 1873.

Hon. Robert Gardner,
Surveyor General:

Dear Sir: Having labored under the impression that it was the duty of our Board of Supervisors to make an order for taking statistics, and as they did not do so, I began the assessment, and, in fact, completed it, without complying with section four thousand and eighty-one, and then had to make a statistical tour throughout the county, which has been the cause of my great delay.

As Ventura County was only organized about the first of March, some of the items in my report I could not fill.

Hoping you will pardon my delay, I am, very respectfully, your obedient servant,

JOHN Z. BARNETT,
Assessor Ventura County.

AGRICULTURAL PRODUCTS.	Number.
Land inclosed in 1872 (county not organized), acres	
Land cultivated in 1872 (county not organized), acres	
Wheat, acres	2,855
Wheat, bushels	22,840
Barley, acres	6,315
Barley, bushels	93,095
Oats, acres	
Oats, bushels	
Rye, acres	
Rye, bushels	
Corn, acres	750
Corn, bushels	22,500
Buckwheat, acres	
Buckwheat, bushels	
Peas, acres	
Peas, bushels	
Peanuts, acres	
Peanuts, pounds	
Beans, acres	
Beans, bushels	150
Castor beans, acres	750
Castor beans, pounds	
Potatoes, acres	300
Potatoes, tons	109
Sweet potatoes, acres	
Sweet potatoes, tons	

AGRICULTURAL PRODUCTS—Continued.

AGRICULTURAL PRODUCTS.	Number.
Onions, acres	....
Onions, bushels	....
Hay, acres	1,200
Hay, tons	330
Flax, acres	....
Flax, pounds	....
Hops, acres	....
Hops, pounds	....
Tobacco, pounds	....
Cotton, acres	3
Cotton, pounds	150
Butter, pounds	275
Cheese, pounds	....
Wool, pounds	24,700
Honey, pounds	....

FRUIT TREES AND VINES.	Number.
Apple trees	1,112
Peach trees	1,936
Pear trees	564
Plum trees	86
Cherry trees	73
Nectarine trees	46
Quince trees	123
Apricot trees	586
Fig trees	596
Lemon trees	77
Orange trees	54
Olive trees	614
Prune trees	127
Mulberry trees	43
Almond trees	14,749
Walnut trees	5,335
Grapevines	178,780
Wine, gallons	5,700
Brandy, gallons	1,210
Distilleries	2
Gallons	6,910
Breweries	....
Gallons	....

LIVE STOCK.	Number.
Horses	1,917
Mules	143
Asses	3
Cows (two years old and over)	889
Calves (under two years old)	607
Beef cattle (steers two years old and over)	3,510
Oxen	12
Total number of cattle	5,022
Sheep	88,508
Cashmere and Angora goats	....
Hogs (one year old and over)	4,410
Hives of bees	32

IMPROVEMENTS.	Number.
Grist mills	....
Steam power	1
Run of stone	1
Water power	1
Run of stone	3
Barrels of flour made	....
Bushels of corn ground	....
Sawmills	....
Steam power	....
Water power	....
Lumber sawed, feet	....
Shingles made	....
Quartz mills	....
Tons of quartz crushed	....
Mining ditches	....
Miles in length	....
Average amount of water used daily, inches	....
Irrigating ditches	2
Acres irrigated	2,800
Value	$15,850
Woolen mills	....
Pounds of wool used	....
Tons of coal mined	....
Railroads	....
Miles in length	....

MISCELLANEOUS.	Number.	Value.
Acres of wheat sown in 1873	2,855	....
Acres of barley sown in 1873	6,315	....
Acres of potatoes planted in 1873	150	....
Acres of oats sown in 1873	....	....
Assessed value of real estate in 1873	....	$1,740,068
Assessed value of improvements on real estate in 1873	....	260,251
Assessed value of personal property in 1873	....	652,256
Estimated total population in 1873	....	5,138
Registered voters in 1873	....	734
Poll tax collected in 1872 (county not organized until March, 1873)	....	....

I hereby certify that the above statement is true and correct.

JOHN Z. BARNETT,
Assessor Ventura County.

REPORT OF RECLAMATION FUND COMMISSIONERS.

This Commission organized May third, eighteen hundred and seventy-two, under the provisions of an Act entitled "An Act to provide for funding the indebtedness of the Reclamation and Levee Districts of the State," approved March thirtieth, eighteen hundred and seventy-two.

The Act creating the Commission appears to have been drawn with considerable care, but in its passage through the Legislature was altered in various places, so that, as it passed, it is full of ambiguities and difficulties in execution, so much so, indeed, as to render it indispensable that the Commission should secure the assistance of counsel learned in the law to interpret its meaning, more especially as at the very outset the operations of the Commission were impeded and retarded by opinions which had been given by eminent counsel as to the unconstitutionality of the law, which culminated ultimately in the Supreme Court being appealed to, in the case of *Kimball* v. *Reclamation Fund Commissioners*.

The Supreme Court having decided in favor of the constitutionality of the Act, the Commission proceeded to prepare the necessary blank forms, and transmitted copies to all persons likely to be interested in reclamation of swamp lands, etc., and received numerous letters from parties in different parts of the State, requesting to be furnished with copies of the necessary forms, with the view of availing themselves of the provisions of the Act, and leading the Commission to suppose that a very large number of districts would be reclaimed under the operations of the Act, and induced them to make preparations for a very large amount of business in connection therewith; but, with the exception of one district, viz: Levee District Number Five, of Sutter County, no district has yet notified this Commission of its intention to avail itself of the provisions of the law.

On the second day of July, eighteen hundred and seventy-two, Levee District Number Five, of Sutter County, forwarded to this Commission a certificate of that date, certifying that the land owners of that district, representing one hundred and two thousand nine hundred and fifty-seven and fifty-eight one hundredths acres, had resolved to fund its indebtedness, already created to the amount of one hundred and forty-four thousand four hundred and seventy-eight dollars, and to make further works of reclamation, amounting to the sum of four hundred and seventy-three thousand five hundred and six dollars, making together the sum of six hundred and seventeen thousand nine hundred and eighty-four dollars; and subsequently, in pursuance thereof, warrants have from time to time been presented to this Board, and bonds issued therefor to the amount of five hundred and eighteen thousand dollars, and further bonds are expected to be applied for shortly, as a large number of men are actively engaged in the works of reclamation of the land comprised in such district.

The Commission has from time to time received numerous letters of inquiry, from various parties in different parts of the State, as to number of districts that have already availed themselves of the pr sions of the Act, and intimating an unwillingness to do so themsel until more districts had taken the initiatory steps for that purpose, they were unwilling to bear the large share of expenses they expec to incur thereby; the consequence is, that, up to the present time, whole burden of expenses have had to be sustained by Levee Distr Number Five, of Sutter County, and, though this Commission h endeavored to conduct its operations with the most rigid economy, the regret extremely that so heavy a burden should have necessarily to borne by one district, but are consoled by the reflection that such result was produced by no action of theirs, or anything that this Boa could have prevented. On the contrary, it would have afforded mu gratification had all the districts in the State availed themselves of th provisions of the Act, and made the expenses very light to all.

One great oversight of the Legislature which enacted the law, w the omission to provide any Fund from which the incidental expenses the Commission could be paid. The consequence has been, that n only has there been no funds from which to pay salaries, but priva purses have had to supply moneys with which to pay the identic expenses of the Commission.

Although there are many glaring defects in the Act creating this Co mission, the Board do not deem it expedient to make any suggestio with the view to their amendment, preferring that such amendmen should emanate from parties interested in the reclamation of the swam lands of the State, as they have reason to believe will be the case.

In conclusion, the Reclamation Fund Commissioners desire to reiter their regret that all the swamp and overflowed land districts in th State have not seen proper to avail themselves of the beneficent pro sions of the Act creating this Commission, as was the opinion of th friends of the measure at the time of its inception and passage, the being, as those best informed in such matters believe, in the neighbo hood of three millions of acres of land in this State needing reclamatio and which, if reclaimed, would be among the most prolific lands in th State, and, besides yielding an enormous revenue to their owners, be universal blessing to mankind.

METEOROLOGICAL REPORT.

By THOMAS M. LOGAN, M. D., Meteorologist to the State Board of Agriculture.

Complemental to our last report, the following table is superadded, with the additional rainfall of eighteen hundred and seventy-three, for ready reference:

RAIN TABLE FOR SACRAMENTO.

Arranged according to the seasons, showing the amount in inches of each month during twenty-four years, and for each rainy season.

MONTHS.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.
September	0.250	0.000	1.000	0.003	0.000	sprinkle.	sprinkle.	sprinkle.	0.000	sprinkle.	0.025	0.063
October	1.500	0.000	0.180	0.000	0.005	1.010	0.000	0.195	0.655	3.010	0.000	0.914
November	2.250	sprinkle.	2.140	6.000	1.500	0.650	0.750	0.651	2.406	0.147	6.485	0.181
December	12.500	sprinkle.	7.070	13.410	1.540	1.150	2.000	2.396	6.632	4.329	1.834	4.282
	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.
January	4.500	0.650	0.580	3.000	3.250	2.670	4.919	1.375	2.444	0.964	2.310	2.668
February	0.500	0.350	0.120	2.000	8.500	3.460	0.692	4.801	2.461	3.906	0.931	2.920
March	10.000	1.880	6.400	7.000	3.250	4.200	1.403	0.675	2.878	1.637	5.110	3.320
April	4.250	1.140	0.190	3.500	1.500	4.320	2.132	sprinkle.	1.214	0.981	2.874	0.475
May	0.250	0.690	0.300	1,450	0.210	1.150	1.841	sprinkle.	0.203	0.981	2.491	0.590
June	0.000	0.000	0.000	0.001	0.310	0.010	0.033	0.350	0.098	1.037	0.017	0.135
July	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.549	0.000
August	0.000	0.000	0.000	0.000	sprinkle.	0.000	0.000	sprinkle.	sprinkle.	0.030	0.000	0.000
Totals.........	36.000	4.710	17.980	36.365	20.065	18.620	13.770	10.443	18.991	17.022	22.626	15.548

RAIN TABLE FOR SACRAMENTO—Concluded.

MONTHS.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.
Sept.........	0.000	0.000	0.003	0.004	0.080	0.000	0.006	0.000	sprinkle.	0.000	0.001	0.002	0.000
Oct..........	sprinkle.	0.355	0.000	0.120	0.480	0.001	0.000	0.000	2.120	0.020	0.210	0.220	0.310
Nov	2.170	0.005	1.490	6.718	2.427	2.426	3.806	0.774	0.850	0.584	1.220	1.930	1.210
Dec..........	8.637	2.327	1.815	7.867	0.364	9.511	12.850	2.612	1.962	0.971	10.590	5.388	10.009
	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.
Jan..........	15.036	1.733	1.077	4.776	7.699	3.440	6.036	4.790	1.371	2.075	4.040	1.230	....
Feb	4.260	2.751	0.186	0.712	2.010	7.104	3.147	3.630	3.236	1.919	4.740	4.360	....
March......	2.800	2.360	1.303	0.481	2.018	1.010	4.348	2.942	1.642	0.690	1.936	0.551	....
April	0.821	1.693	1.080	1.370	0.476	1.805	2.306	1.240	2.120	1.454	0.610	0.512	....
May.........	1.808	0.355	0.742	0.460	2.252	0.008	0.270	0.648	0.270	0.756	0.280	0.000	....
June........	0.011	0.000	0.087	0.000	0.100	0.000	sprinkle.	0.008	sprinkle.	0.001	0.025	0.002	....
July.........	0.000	0.000	0.000	0.004	0.018	0.000	0.000	0.000	sprinkle.	0.000	0.000	0.015	....
August ..	0.006	0.000	0.085	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	sprinkle	....
Total...	35.549	11.579	7.868	22.512	17.924	25.305	32.769	16.644	13.572	8.470	24.052	14.208	....

Maximum quantity of rain in each month, minimum in each month, and average quantity in each month, at Sacramento, since 1849.

	January.	February.	March.	April.	May.	June.	July.	August.	September	October.	November	December.
Maximum	15.0 (1862)	8.5 (1854)	10.0 (1849)	4.3 (1855)	2.5 (1860)	0.4 (1857)	0.5 (1860)	0.0	1.0 (1851)	3.0 (1858)	6.7 (1864)	13.4 (1852)
Minimum.................	0.6 (1852)	0.1 (1852)	0.5 (1865)	0.0 (1857)	0.0 (1857)	0.0	0.0	0.0	0.0	0.0	0.0 (1850)	0.0 (1850)
Mean	3.5	2.7	3.0	1.6	0.8	0.0	0.0	0.0	0.0	0.4	1.9	5.4

It will be seen, in the above table, that there has been a rainfall of 11.529 inches for the present season, prior to January, eighteen hundred and seventy-four, the present time of writing.

Following up the theory advanced in our last report that, in proportion to the amount of precipitation in the first half of the rainy season, so will the rainfall be in the second half of the season, we may calculate on at least twice the quantity already received, or about a total of twenty-two inches, for reason of the thorough saturation of the earth's surface in this locality. Let us look a little further into the facts on which our theory is based. In eighteen hundred and seventy-one, for the first four months of the rainy season, we find a rainfall of 12.021 inches, followed in January, February, March, and April, with a fall of 11.631 inches. In eighteen hundred and sixty-seven, the autumnal rains were 16.662 inches, followed by 16.107 inches. In eighteen hundred and sixty-six, the rains in Autumn measured 11.938 inches, followed by 13.367 inches.

Last year there was a slight falling off in the second term, but still the rule seemed to hold good. We might push our investigations further and find similar results. Now this subject of forming a criterion of the quantity of rain that is likely to fall in the second half of the season, from the known quantity of the first half, is a very important one for our agricultural interests, and it is surprising that our farmers everywhere do not pay more attention to the keeping of rain records. If they would generally follow the worthy example of Mr. J. W. A. Wright, of Turlock, Stanislaus County, we would in due time be enabled to frame a table from which generalizations of great value might be drawn. We would gladly furnish the proper, uniformly printed forms for recording daily meteorological observations, and, as a model for this purpose, we herewith copy from the *Mining and Scientific Press* the valuable contribution from Turlock, just referred to:

CLIMATE OF SAN JOAQUIN VALLEY.

A farmer's steady work and busy thoughts in laying the foundation for another crop, have delayed the preparation of a report in full for eighteen hundred and seventy-two of the temperature and rainfall of our inland climate. But here it is at last, made out for twelve months, on the plan adopted for the past year. It enables us to approximate, for the first time, from actual observations for this part of the San Joaquin Valley, the average and range of temperature for the year, as well as for our Spring, Summer, Autumn, and Winter. I say to *approximate*, for we must remember, that to arrive exactly at such general averages for any climate, requires similar observations to be accurately made, recorded, and calculated for at least ten years; indeed, it is almost the work of a lifetime. Such as it is, however, permits the hope that it will not be a useless contribution to aid some future worker in making out the meteorology of our State. We have tried, by careful calculations, from at least a thousand observations made in the course of the year, at or near the hours indicated, to form an accurate and trustworthy

TABLE OF TEMPERATURE AND RAINFALL.

YEAR 1872.	Average temperature.			Monthly mean...	Highest temperature	Lowest temperature.........	Rain—Inches...
	7 A. M.	2 P. M.	9 P. M.				
January	40.20	52.30	46.15	46.21	61	27.34	2.38
February	44.68	59.11	49.69	51.16	67	34.33	2.42
March	46.16	63.60	50.40	53.38	70	36.34	1.45
April	48.21	66.40	50.80	55.13	77	36	0.97
May	56.45	78.39	58.65	64.49	90	40	0.00
June	64.57	86.86	65.25	72.23	110	52	0.18
July	68.23	92.48	71.15	77.28	104	61	0.00
August	69.68	91.72	71.95	77.78	110	59.51	0.04
September	63.59	88.25	69.37	73.74	101	43.58	sprinkle.
October	50.57	77.19	57.25	61.67	94	38.58	sprinkle.
November	39.68	6 .56	47.46	50.21	72	23.49	0.28
December	36.74	56.77	41.57	45.02	63	10.53	4.70
Annual	52.39	73.04	56.64	60.69	110	10	12.42

Our locality, as has already been mentioned in the *Press*, is on the plains of Stanislaus County, midway between the Sierra and Coast Range Mountains, and about half way between the Tuolumne and Merced Rivers. As we are not far from the center of the great grain-producing region of the San Joaquin Valley, our climate may be correctly taken as a type of the climate of the entire valley.

Let us briefly sketch the observations, and record results. It is seen that the table gives:

First—The average temperature for each month at seven, two, and nine o'clock; also, the monthly average.

Second—The average temperature for the year at the same hours, as well as the annual average.

Third—The highest and lowest temperature the thermometer indicated each month and for the year.

Fourth—The amount of rain in inches and hundredths for each month and for the year.

A few words of explanation about the manner in which these averages were obtained.

For each month, all the observations at seven A. M. were added and divided by the number of days on which the temperature at that hour was noted. The same was done for all the observations at two and nine P. M. To obtain the monthly mean, these average temperatures for seven, two, and nine, were added and divided by three. For the year all the monthly means were added and divided by twelve.

The rainfall for eighteen hundred and seventy-two, 12.42 inches, must not be confounded with that of the wet season of eighteen hundred and seventy-one and eighteen hundred and seventy-two, which was about sixteen inches; nor that of eighteen hundred and seventy-two and eighteen hundred and seventy-three, which to date of writing is about ten inches. Also, our having no rain in May should be remembered as a very uncommon occurrence. Eight miles east of us, on the Merced, and forty miles southeast along the Chowchilla, more than half an inch fell that month. We generally have as much or more. But in dry Springs, like the last, it is usual for our rains to come in spots and streaks throughout the valley.

Two points of special interest, in such a table, to which we wish to call attention, are the average and range of temperature for the year. As was mentioned in a previous article, the decimals of temperature are needed only for accuracy in calculations and comparisons. For practical purposes they may be dropped, and if over one half, the preceding degrees should be called one greater.

1. The average temperature at seven A. M. is seen to be fifty-two degrees; at two P. M., seventy-three degrees; at nine P. M., fifty-seven degrees; and the annual average, sixty-one.

The latter is the most important item in the entire table, as it gives the means of correct comparison with other climates throughout the world.

By adding the averages for the months composing each season, and dividing by three, we obtain the following average temperatures: For Spring, fifty-eight, or one degree above the average at nine P. M., for the year; for Summer, seventy-six, or three degrees above the average at five P. M.; for Autumn, sixty-two, or one degree above the general average for the year; for Winter, forty-seven, or five degrees below the average at seven A. M.

2. By range of temperature is meant the difference between extremes of heat and cold. From the table, this can be obtained for each month and for the year. At present, we shall call attention only to the annual range, one hundred degrees.

The highest temperature recorded is one hundred and ten, in June and August; the lowest, ten, in December. This makes the range for the year one hundred degrees, which is exactly the same as the range of temperature found to exist in the central portion of the cotton States.

We had the coldest weather, by six degrees, last December, that has been experienced on our plains for five Winters past. The lowest previously observed was sixteen degrees, in December, eighteen hundred and sixty-nine. Last Winter we had ice an inch thick. In one instance, within the knowledge of the writer, the ice was so thick on a deep slough along the Merced River, as to enable a man of over one hundred and fifty pounds weight to walk across it without difficulty. The like has not be known in this part of California for many years. More than once the Coast Range Mountains were white with snow for several days at a time.

Even in portions of San Joaquin Valley, during one storm, a few flakes of snow fell. This is a great rarity. Occasionally we have had a small amount of fine hail. As eighteen hundred and seventy-two has been rather a cool year, its average temperature of 60.69, or sixty-one degrees, will probably be proved, by future observations, to be somewhat lower than the general annual temperature of our climate. It is, however, such a medium temperature as we would reasonably expect between the mean temperature at Sacramento, to the northward, which is given as 59.90, and San Diego, toward the south, which is sixty-two degrees. By comparing our California temperature with remote localities, in various parts of the world, we arrive at the following general results:

While the mean temperature of San Francisco is nearest to that of Bordeaux (France), Pekin (China), and New York, that of our inland valleys, and Southern California, is almost identical with that of Southern France, Central Italy, and Southern Japan. To the latter, we might also add the Holy Land and that portion of the Southern States along the Valley of the Tennessee, in North Alabama, around Huntsville and Tuscumbia, where the average annual temperature is not far from sixty-one degrees.

The following table will show more plainly wherein these climates agree, and how they differ:

TEMPERATURES OF VARIOUS LOCATIONS.

PLACES.	MEAN TEMPERATURE.			Range bet. west and south……	Latitude north……
	Year.	Summer.	Winter.		
San Francisco…………	55.85	50.59	58.97	8°	37° 47′
Bordeaux…………	56.48	42.08	70.88	29°	44° 50′
Pekin…………	54.86	26.42	82.58	56°	39° 54′
New York…………	53.78	29.84	79.16	49°	40° 40′
Sacramento…………	59.90	48.46	70.77	22°	38° 32′
San Joaquin Valley…………	60.69	47.46	75.75	28°	37°(about.)
Rome…………	60.44	45.86	75.20	29°	41° 53′
Marseilles…………	59.00	45.50	72.50	27°	43° 17′
Nagasaki…………	60.80	39.38	82.94	44°	32° 45′

The column for range or difference between the Summer and Winter of respective climates has been estimated in the table to show that though the annual temperature of various places may agree closely, their differences between extremes of heat and cold may vary greatly. Indeed, this is the chief mark of distinction between climates. The range between Summer and Winter averages in San Francisco is only eight degrees, which makes it as an equable climate one of the most wonderful in the world. In our inland valleys, in Bordeaux, and in Rome, the range is three times as great; in Japan, five times; in New York, six times; and in Pekin, seven times as great.

The most striking agreement we find is between our temperature in San Joaquin Valley and that of Rome. Both the averages and range are almost identical. The remarkable similarity between the climate of parts of California and Italy, which has been so often asserted, is not then a dream, but is proved to mathematical certainty by the stubborn logic of facts.

For the same purpose with which the foregoing observations respecting the climate of the San Joaquin Valley have been recorded, as well as to apply a corrective to former publications, the following table of the temperature of San Diego, with the accompanying remarks, is here inserted. Representing the coast climate of the extreme southern part of the State, it is very valuable, and affords a strong contrast, not only with the interior valley climates, of which Turlock affords an example, but also with the sierra climate of the northern portion of the State. The observations for San Diego were taken by the Signal Service Observer of the War Department at the hours of 4.55 A. M., 1.55 P. M., and 8.55 P. M.—such being the hours corresponding with those at which the observations are taken at Washington, viz: 7.35 A. M., 4.35, and 11.35 P. M.—the difference of time between San Diego and Washington being 2 h. 40 m.

WAR DEPARTMENT, SIGNAL SERVICE, U. S. A.,
OBSERVER'S OFFICE, SAN DIEGO, (Cal.)

TABLE OF TEMPERATURE

Showing the mean of the 4.55 A. M., 1.55 P. M., *and* 8.55 P. M., *observations of the thermometer for each month, the monthly and yearly mean, maximum and minimum temperature, extreme range, and maximum and minimum daily range during the twelve months ending October thirty-first, eighteen hundred and seventy-two.*

MONTHS.	Monthly mean of the 4:55 A. M. observations	Monthly mean of the 1:55 P. M. observations	Monthly mean of the 8:55 P. M. observations	Monthly mean of the 4:55 A. M., 1:55, and 8:55 P. M. observations.	Maximum temperature during the month	Minimum temperature during the month	Extreme range during the month	Mean daily range	Maximum daily range	Minimum daily range
1871.										
November	52.10	66.66	56.96	58.57	78.	41.	37.	14	25	3
December	51.70	64.51	55.16	57.12	81.	43.	38.	13	27	5
1872.										
January	46.45	60.64	53.83	53.65	73.	38.	35.	14	26	5
February	46.86	61.58	53.45	53.96	68.	43.	25.	11	18	6
March	50.74	63.29	50.06	54.69	71.	44.	27.	13	23	6
April	50.01	62.66	54.76	55.81	74.	43.	31.	13	23	3
May	56.12	66.32	58.67	60.37	83.	49.	34.	10	27	5
June	60.03	71.50	60.14	63.89	83.	55.	28.	12	23	7
July	63.25	73.00	64.83	67.01	75.	58.	17.	10	14	8
August	65.16	74.54	67.03	68.91	86.	60.	26.	9	15	6
September	61.13	73.00	64.40	66.17	80.	54.	26.	12	18	6
October	57.80	69.09	60.74	62.54	87.	45.	42.	12	31	7
Yearly mean	55.11	67.23	58.35	60.22	78.25	45.5	30.5	12	22	5.5

J. B. WELLS,
Observer Signal Service, U. S. A.

It is shown in this table that the greatest range between the monthly means does not exceed fifteen degrees. The maximum yearly mean reached 78.25°, while the minimum yearly mean was 45.05°, making the range for the year 33.20°. We have no record of any other place except Santa Barbara, that reveals so equable a climate. During the year embraced within this record, the prevailing winds were from the northwest, and had a mean daily velocity of one hundred and fifty-eight miles, aggregating for the year fifty-seven thousand nine hundred and thirty miles. The mean daily velocity of the morning and night observations was three miles per hour, and at mid-day thirteen miles per hour. These are interesting facts, showing that the force of the wind is at no time unpleasantly strong—while it is also strongest when most needed—when the sun is crossing the meridian. The rainfall during the year was six and one half inches.

FOREST CULTURE.

FOREST CULTURE.

[From the Report of the Commissioner of Agriculture for 1872.]

THE FORESTS OF THE UNITED STATES.

There has of late been expressed so much apprehension of the ultimate destruction of our forests, and of a great scarcity of timber at no distant day, that a statistical examination of the subject may prove neither unimportant nor uninteresting. Fortunately, data presumed to approximate completeness are furnished by the census of eighteen hundred and seventy. This enumeration includes only farm lands, leaving untouched the wild, or unoccupied tracts of the old States, and all the lands in the new States still owned by the Government. The wild lands of the old States would tend to increase the proportion of forest lands of the entire country, while the public or unsold lands so generally treeless, would tend to diminish the grand percentage of area in woodland. The percentage deducted from the census returns, which includes only the area in farms, is thirty-nine. If the total area of the country is included, the percentage will be diminished to about twenty-five per cent. In eighteen hundred and sixty-six, before any enumeration of the forest lands was ever made, the following statement concerning the forest lands in the United States appeared in the monthly report:

"The proportionate area of forests to the total area of the United States must be somewhat more than that of Russia. Exclusive of the great plains, the western prairies, the forestless portions of oak openings, the glades of the Alleghanies, the lakes, and the cultivated area of the United States, the forests are reduced quite as much as is compatible with true public economy and safe and healthful climatic conditions. West of the Mississippi the scarcity of forests depreciates by unnumbered millions the value of that vast area. East of that river and north of thirty-eight degrees the forest areas cannot be materially curtailed without serious risk, some portions requiring new forest plantations, and others admitting of judicious thinning or clearing. In the South, which is nearly covered with forests, some diminution of the forest area is admissible, while indiscriminate clearing might occasion radical changes in climate and production, more destructive in their character than the same decrease of forests in higher latitudes. Estimating the forest area in the United States at thirty-three per cent, and our population at thirty-five million, the number of acres per head would be eighteen, thus exceeding every European country except Norway."

This hasty jump at an estimate—a leap almost wholly in the dark—proves too high, if the immense treeless areas of the Territories are included, while it is too low for the States exclusive of the Territories. The proportion of forest in our entire area is, therefore, exceeded by that of Russia, as well as of Norway and Sweden, and the proportion of Germany may also slightly exceed that of this country.

The following statement of the proportions of land in forests in the different countries of Europe is made on the authority of the German writer, Reutzsch:

Countries.	Per cent.	Acres per head of pop.
Norway	66.0	24.61
Sweden	60.0	8.55
Russia	30.90	4.28
Germany	26.58	0.6638
Belgium	18.52	0.186
France	16.79	0.3766
Switzerland	15.0	0.396
Sardinia	12.29	0.223
Naples	9.43	0.138
Holland	7.10	0.12
Spain	5.52	0.291
Denmark	5.50	0.22
Great Britain	5.0	0.1
Portugal	4.40	0.182

In some of the States the farm lands comprise nearly the entire area, exclusive of lakes and streams; in others, those more recently settled, and also some of the original thirteen, the unoccupied or wild lands constitute a considerable proportion of the whole area. Thus Maine has five million eight hundred and thirty-five thousand and fifty-eight acres in farms, while her area includes twenty-two million four hundred thousand acres of land and water. In the table following, an estimate of the forest area, outside of that belonging to farms, is added to the total acreage of farm woodlands, to make the estimated total area in forest. In estimating the proportion in woodland, the amount of water in lakes and streams, of prairie, and of ledges and other wastes incapable of producing trees, must be taken into consideration. After canvassing the facts affecting this proportion in the several States, of the area exclusive of farms, one half was assumed to be in forest in Maine, New Hampshire, Vermont, Pennsylvania, Maryland, Virginia, Florida, Arkansas, Tennessee, and West Virginia; six tenths were taken for North Carolina, South Carolina, Georgia, Alabama, Mississippi, and Louisiana; one third was taken for Massachusetts, New York, New Jersey, Kentucky, Michigan, and Missouri; one fourth for Texas and Oregon; one sixth for Wisconsin and Minnesota; one eighth for Iowa; one tenth for Rhode Island, Connecticut, Ohio, Indiana, and Illinois; one twelfth for California; one twentieth for Kansas, Nebraska, and Nevada. The proportion assumed respectively for the Territories is: Washington, thirty-three per cent; Montana, sixteen; Idaho, fifteen; Utah, ten; Wyoming and Indian, eight; New Mexico and Arizona, six; Dakota, three. The result of adding this outside forest to that of the farm lands is given in the following table, which shows the percentage of forest area of States and Territories (second column) in comparison with the census percentage, which includes only the official enumeration of farms:

STATES.	Percentage in farms.	Total percentage.	STATES.	Percentage in farms.	Total percentage.
Maine	38.1	46.9	Indiana	39.6	34.8
New Hampshire	29	37.2	Illinois	19.6	16.9
Vermont	30.6	36.5	Wisconsin	29.3	20.9
Massachusetts	25.8	29.2	Minnesota	20.6	17.1
Rhode Island	33.7	24.2	Iowa	16.2	14.1
Connecticut	24.4	21.2	Missouri	41.3	37.4
New York	25.5	27.6	Kansas	11.2	5.6
New Jersey	24	28.1	Nebraska	10.2	5.2
Pennsylvania	31.9	38.9	California	4.1	7.9
Delaware	28	29.2	Oregon	31.8	25.2
Maryland	31.8	38.4	Nevada	6.4	5
Virginia	45.7	46.8			
North Carolina	60.6	60.3	TERRITORIES.		
South Carolina	53.2	56.2			
Georgia	54.6	56.6			
Florida	60	50.6	Colorado	3.5	9.9
Alabama	56	58.1	Utah	0.1	9.9
Mississippi	60.6	60.2	New Mexico	12.7	6
Louisiana	56.9	59.1	Washington	44.8	33.1
Texas	41.6	26.7	Dakota	7.4	3
Arkansas	51.4	50.3	Montana	0.8	15.9
Tennessee	55	53.3	Idaho	9.6	14.9
West Virginia	51.1	50.6	Arizona	....	5.9
Kentucky	48.9	45.4	Wyoming	0.8	7.9
Ohio	31.7	28.4	Indian	....	7.9
Michigan	40.7	35.3	Alaska	....	30

The census percentage is increased in some States, and diminished in others, according to circumstances. In Maine scarcely more than one fourth of the area is in farms; the remaining land being covered, generally, with forest growths, though culled of valuable timber, increases the census percentage from 38.1 to 46.9, and the increase would be much greater (than the estimated proportion of one half) but for the remarkable extent of water-surface in addition to barren ledges and other wastes. Rhode Island, on the contrary, has five hundred and two thousand three hundred and eight acres in farms, of its eight hundred and thirty-five thousand eight hundred and forty—so large a proportion of the whole that nine tenths of the remainder, three hundred and thirty-three thousand five hundred and thirty two acres, are assumed to be water, rock, roads, etc., thus reducing the percentage of total area in forest from 33.7 to 24.2. New York has nearly two thirds of its area in farms, and so much water throughout the State, especially the lakes the western and northern sections, that only one third of its seve million eight hundred and eighty-nine thousand one hundred and ninet acres in farms is assumed to be in forests. Florida, though having le than one tenth of its area in farms, has so large a proportion of wate area that it is not deemed safe to estimate more than half the unocc pied surface in woods, which reduces the census percentage from 60 t 50.6. Ohio has its available area nearly all occupied by farms, and it percentage is, therefore, reduced from 31.7 to 28.4. The amended per centage, if the estimates are accurate, must be the true proportion for the entire State, and it is undoubtedly nearer the actual percentag than the figures representing only farm lands.

The following table presents a statement of the area in farms, that outside of farms, the total area, and the forest acreage in farms alone, and the entire area of each State and Territory:

STATES AND TERRITORIES.	No. acres in farms.	No. acres not in farms.	No. acres in total area.	No. acres of woodland in farms.	Estimated total area in woodland.
STATES.					
Maine	5,838,058	16,561,942	22,400,000	2,224,740	10,505,711
New Hampshire	3,605,994	2,333,206	5,939,200	1,047,090	2,213,698
Vermont	4,528,804	2,006,876	6,535,680	1,386,934	2,390,373
Massachusetts	2,730,283	2,261,717	4,992,000	706,714	1,460,619
Rhode Island	502,308	333,532	835,840	169,399	202,753
Connecticut	2,364,416	675,584	3,040,000	577,333	644,891
New York	22,190,810	7,889,190	30,080,000	5,679,870	8,309,600
New Jersey	2,989,511	2,335,289	5,324,800	718,335	1,496,784
Pennsylvania	17,994,200	11,445,800	29,440,000	5,740,864	11,463,764
Delaware	1,052,322	304,478	1,356,800	295,162	396,654
Maryland	4,512,579	2,606,781	7,119,360	1,435,988	2,739,378
Virginia	18,145,911	6,399,369	24,545,280	8,294,734	11,494,418
North Carolina	19,835,410	12,615,150	32,450,560	12,026,894	19,595,984
South Carolina	12,105,280	9,654,720	21,760,000	6,443,851	122,36,683
Georgia	23,647,941	13,472,059	37,120,000	12,928,084	21,011,319
Florida	2,373,541	35,557,979	37,931,520	1,425,786	19,204,775
Alabama	14,961,178	17,500,902	32,462,080	8,380,332	18,880,873
Mississippi	13,121,113	17,058,727	30,179,840	7,959,384	18,194,689
Louisiana	7,025,817	19,435,623	26,461,440	4,003,170	15,664,549
Texas	18,396,523	157,191,317	175,587,840	7,662,294	46,960,139
Arkansas	7,597,296	25,809,424	33,406,720	3,910,325	16,815,037
Tennessee	19,581,214	9,602,786	29,184,000	10,771,396	15,572,789
West Virginia	8,528,394	6,191,606	14,720,000	4,364,405	7,460,208
Kentucky	18,660,106	5,455,094	24,115,200	9,134,658	10,953,029
Ohio	21,712,420	3,864,540	25,576,960	6,883,575	7,270,009
Michigan	10,019,142	26,109,498	36,128,640	4,080,146	12,783,319
Indiana	18,119,648	3,518,112	21,637,760	7,189,334	7,541,145
Illinois	25,882,861	9,579,539	35,462,400	5,061,578	6,019,531
Wisconsin	11,715,321	22,796,039	34,511,360	3,437,442	7,236,781
Minnesota	6,483,828	46,976,012	53,459,840	1,336,299	9,165,634
Iowa	15,541,793	19,687,007	35,228,800	2,524,793	4,985,688
Missouri	21,707,220	20,116,780	41,824,000	8,965,229	15,670,829
Kansas	5,656,879	46,386,641	52,043,520	635,419	2,954,753
Nebraska	2,073,781	46,563,019	48,636,800	213,374	2,541,524
California	11,427,105	109,520,735	120,947,840	477 880	9,604,607
Oregon	2,389,252	58,586,108	60,975,360	761,001	15,407,528
Nevada	208,510	71,529,090	71,737,600	13,415	3,589,869
Total of States	405,226,769	869,932,271	1,275,159,040	158,867,227	380,639,793
TERRITORIES.					
Colorado	320,346	66,559,654	66,880,000	11,504	6,667,469
Utah	148,361	53,916,682	54,065,043	215	5,391,883
New Mexico	833,549	76,735,091	77,568,640	106,283	4,710,388
Washington	649,139	44,147,021	44,796,160	291,206	14,859,722
Dakota	302,376	96,293,752	96,596,128	22,605	2,911,417
Montana	139,537	91,877,103	92,016,640	1,198	14,701,534
Idaho	77,139	55,151,021	55,228,160	7,476	8,280,129
Arizona	21,807	72,884,433	72,906,240	....	4,373,065
Wyoming	4,341	62,640,727	62,645,068	35	5,011,293
Indian	....	44,154,240	44,154,240	....	3,532,339
Alaska	....	369,529,600	369,529,600	....	110,858,880
Total of Territories	2,496,595	1,033,889,324	1,036,385,919	440,522	181,298,119
Grand total	407,723,364	1,903,821,505	2,311,544,950	159,307,749	561,937,912

Taking into consideration only the farm lands, the proportion of wood lands is smallest in California, being 4.1 per cent. In order, respectively, follow Nevada, 6.4 per cent.; Nebraska, 10.2; Kansas, 11.2; Iowa, 16.2; Illinois, 19.6. The proportion increases, State by State, from the Pacific coast eastward to Indiana (39.6 per cent.), and then comes the devastation of the axe, which reduces the percentage of Ohio, a region originally forest with the exception of small patches of prairie mainly about the headwaters of the Miami, to 31.7 per cent. Pennsylvania has about the same proportion, or 31.9, and New Jersey twenty-four per cent.

There are only two other Western States that have percentages between twenty and thirty, viz: Minnesota, 20.6; Wisconsin, 29.3. The Eastern States (besides New Jersey) which come within the same limits, are Connecticut, 24.4; New York, 25.5; Massachusetts, 25.8; Delaware, twenty-eight; New Hampshire, twenty-nine; Vermont, 30.6. Those having between thirty and forty per cent of this farm area in forest are: Pennsylvania, Indiana, named above; Oregon, 31.8; Maryland, 31.8; Rhode Island, 33.7; Maine, 38.1. The States having between four and five tenths of their farm lands in forest are three: Michigan, 40.7; Texas (the eastern portion generally wooded), 41.6; Virginia, 45.7. Th southern belt is the most heavily wooded portion of the country, a the States, with the exception of Virginia and Texas, having more tha half their farm areas in woodland, and a larger portion still if th wooded wild lands should be counted in with the farm lands. The proportion in the occupied or farm areas is as follows: West Virginia, 51.1; Arkansas, 51.4; South Carolina, 53.2; Georgia, 54.6; Tennessee, fifty-five; Alabama, fifty-six; Florida, sixty; North Carolina and Mississipp, each 60.6 per cent.

The Territories have only a very small portion of their respective areas in farms. Here and there a small survey has been made, near some town, along some stream, or in the neighborhood of mining operations. The areas in wood are mainly among the mountains, the most heavily wooded on northern slopes and in the gorges protected from the winds; the proportion given for farm lands is, therefore, in all probability, less than the real portion for the entire area of a Territory, notwithstanding the fact that available woodlands in surveyed tracts are rapidly taken up by farmers. Utah, one tenth of one per cent; Montana and Wyoming, eight tenths of one per cent; Colorado, 3.5; Dakota, 7.4; Idaho, 9.6; New Mexico, 12.7; Washington, 44.8.

Most of the States, in their several counties, exhibit great diversity in the abundance of their wood and timber supplies. In the new States it is due to the existence of prairies, or treeless plains, traversed by streams shaded by a line of forest, which characterize the surface of all, or a portion of a State; in the older States it is simply the result of settlement and cultivation, in the destruction of forests, by clearing lands for farms, for supplies of wood for fuel, in obtaining timber for building and for the various uses of mechanism. East of the Alleghanies almost the entire surface of the land was originally in forest. On the very summit of the Alleghanies are comparatively large tracts of level meadows, or mountain prairies, known as "glades," which are found in undrained soils not suited to the growth of trees, though this mountain-chain is generally wooded, on slope and summit, with as fine and various an arborescent growth as can be seen in any part of the North American continent. West of the mountains, through West Virginia, Ohio, and Kentucky, there was little less than forest in the times of the aborigines; and in Northeastern, Southern, and Southwestern Indiana, a wooded surface was the prevailing characteristic, and even now it is a favorite resort for obtaining black walnuts and poplars of enormous size, and great boles of oaks, fit for the masts of many a "man-of-war." The South was and is a wooded region, with very few and small prairies in the valley of the Mississippi, and none really worth mentioning until Central Texas is reached. In Northern Missouri are extensive prairies, but almost half the area of the State is now covered with forest, notwithstanding the extensive clearing of farm lands during more than fifty years since its settlement; and more than half the surface of Arkansas and Louisiana, both west of the Mississippi, is now covered with wood. Meteorological records show that the lines of equal moisture, in this section, run northeast and southwest, through Western Kansas, Eastern Nebraska, Iowa, and Wisconsin; the records of the rainfall of any given period correspond on that line, rather than with a line through Kansas and Missouri; so the rains of Central Nebraska and Minnesota, in point of time and quantity, correspond more nearly than those of Nebraska and Iowa. As might naturally be expected, we find the forest boundary, from Texas to Illinois, beyond which the prairies stretch westward, running in a general direction corresponding with the lines of equal rainfall. As a result (though the lack of trees farther west cannot be attributed to insufficient rainfall alone), we find plains predominating in Western Texas, in nearly all the Indian Territory, in a strip of Western, and nearly all of Northern Missouri, in a large portion of Illinois, and in Western and Northern Indiana, nearly to Lake Erie. Southern Illinois has an average proportion of forest. The entire area of farm lands in Illinois, as reported by the last census, is twenty-five million eight hundred and eighty-two thousand eight hundred and sixty-one acres, of which five million sixty-one thousand five hundred and seventy-eight acres, or 19.6 per cent, were reckoned as woodland. The belt south of the Ohio and Mississippi Railroad has a percentage of 43.5, which is greater than that of Missouri, and almost equal to that of Virginia. These counties are as follows:

COUNTIES.	Per cent.	COUNTIES.	Per cent.
Monroe	47.1	Saline	49.0
Washington	23.7	Williamson	47.3
Wayne	48.1	Jackson	50.9
Edwards	49.0	Union	50.7
Wabash	40.7	Johnson	00.0
Randolph	53.3	Pope	61.0
Perry	42.1	Hardin	61.3
Franklin	02.3	Massac	57.0
Hamilton	50.4	Pulaski	39.2
White	45.5	Alexander	56.2
Gallatin	56.8	Jefferson	44.2

The district lying between this railroad and the fortieth parallel contains twenty-nine counties, and averages twenty-five per cent of woodland, and is made up as follows:

COUNTIES.	Per cent.	COUNTIES.	Per cent.
Macoupin	21.3	Montgomery	14.3
Jersey	34.9	Shelby	18.9
Saint Clair	24.7	Cumberland	33.2
Clinton	23.5	Clark	45.1
Marion	25.7	Coles	17.6
Clay	34.6	Edgar	19.2
Richland	39.6	Douglas	7.1
Lawrence	44.3	Moultrie	13.6
Crawford	37.1	Christian	7.0
Jasper	39.3	Sangamon	10.3
Effingham	27.7	Morgan	16.9
Fayette	31.4	Pike	34.6
Bond	22.4	Scott	33.9
Madison	24.8	Calhoun	61.0
Greene	31.2		

The northern counties between the fortieth parallel and the Wisconsin line make an average of only 11.4 per cent.

COUNTIES.	Per cent.	COUNTIES.	Per cent.
Adams	26.8	Stark	8.0
Brown	30.0	Marshall	14.3
Cass	25.1	Putnam	29.3
Menard	19.0	La Salle	8.2
Logan	5.1	Grundy	3.0
Macon	7.8	Kankakee	3.2
Piatt	5.2	Will	5.3
Champaign	3.3	Cook	5.0
Vermillion	11.9	Du Page	9.2
Hancock	11.6	Kendall	7.8
McDonough	16.0	Kane	12.5
Schuyler	34.7	DeKalb	4.9
Fulton	34.7	Lee	3.5
Mason	11.6	Bureau	9.1
Tazewell	15.6	Rock Island	15.0
McLean	6.9	Whitesides	6.2
Ford	1.4	Carroll	11.9
Iroquois	5.5	Ogle	11.6
Livingston	2.8	Lake	8.3
Woodford	9.2	McHenry	15.5
Peoria	21.9	Boone	17.5
Knox	10.4	Winnebago	12.6
Warren	8.8	Stephenson	13.8
Henderson	18.2	Jo Daviess	28.8
Mercer	15.7	De Witt	13.6
Henry	4.0		

The influence of the rivers, especially the Mississippi and the Wabash, in extending forests, is plainly marked. From the mouth of the Ohio to the fortieth parallel are eleven counties, Alexander, Union, Jackson, Randolph, Monroe, Saint Clair, Madison, Jersey, Calhoun, Pike, and Adams, and they average 37.3 per cent; northward, on the Mississippi, Hancock, Henderson, Mercer, Rock Island, Whitesides, Carroll, and Jo Daviess, averaging 14.8 per cent. The tract between the Saint Louis and Alton Railroad and the Illinois River, in the prairie belt, comprising Jersey, Greene, Scott, Morgan, Cass, Mason, Menard, Tazewell, Woodford, Logan, Marshall, Putnam, Grundy, Sangamon, fourteen counties, averages 16 per cent; and the counties between that road and the Chicago branch of the Central, comprising Madison, Bond, Macoupin, Fayette, Effingham, Shelby, Montgomery, Christian, Kankakee, McLean, De Witt, Macon, Moultrie, Piatt, Ford, Will, and Livingston, comprising seventeen counties, average 13 per cent.

In some of the older States the proportion of woodland is quite as variable as in Illinois. Pennsylvania has an average percentage of 31.9, but Montgomery County has only 7.8, while Cameron has 88.3. The mountain counties have high percentages. On the Delaware, Wayne in the northeast has 50.9, and Pike, 76. The northern tier has more than an average proportion of wood, especially McKean and Warren, which have respectively 61 and 60.1 per cent. The counties bordering on Ohio fall below an average. In the agricultural portion of Eastern Pennsylvania the axe has left only a minimum of wood, Cumberland having only 11.7; Lancaster, 12.1; Chester, 14; Berks, 15; Delaware, near Philadelphia, has but 10; Montgomery, 7.8; and Bucks, 10.9.

COUNTIES.	Per cent.	COUNTIES.	Per cent.
Adams	20.5	Juniata	40.1
Alleghany	23.0	Lancaster	12.1
Armstrong	34.0	Lawrence	24.4
Beaver	28.8	Lebanon	21.2
Bedford	48.8	Lehigh	14.6
Berks	15.0	Luzerne	34.6
Blair	27.5	Lycoming	36.0
Bradford	34.5	McKean	61.0
Bucks	10.9	Mercer	26.9
Butler	36.4	Mifflin	34.6
Cambria	58.2	Monroe	33.4
Cameron	88.3	Montgomery	7.8
Carbon	43.8	Montour	22.9
Centre	36.7	Northampton	8.0
Chester	14.0	Northumberland	23.8
Clarion	34.8	Perry	41.1
Clearfield	47.4	Philadelphia	5.2
Clinton	32.1	Pike	76.0
Columbia	32.2	Potter	51.9
Crawford	35.0	Schuylkill	33.0
Cumberland	11.7	Snyder	31.9
Dauphin	24.7	Somerset	47.0
Delaware	10.0	Sullivan	53.8
Elk	63.7	Susquehanna	23.7
Erie	30.4	Tioga	41.8
Fayette	35.7	Union	20.3
Forest	60.3	Venango	43.4
Franklin	21.0	Warren	60.1
Fulton	42.7	Washington	21.6
Greene	31.5	Wayne	50.9
Huntingdon	48.0	Westmoreland	28.6
Indiana	37.1	Wyoming	36.1
Jefferson	44.7	York	18.7

North Carolina has a wealth of woodland, the percentage to farm area being 60.6, one county, Brunswick, having over 90 per cent, and no less than eleven others between 80 and 90, viz: Bladen, Beaufort, Craven, Cumberland, Jackson, Macon, Mitchell, Onslow, Polk, Transylvania, and Watauga. Some of these are near the ocean, and others among the mountains. A difference in altitude of more that six thousand feet, differences of latitude, of surface, and of soil, render this State remarkable for the variety found in its flora, which ranges from the palmetto to the pine; from semi-tropical forms, to vegetation almost alpine in character. None of the States can exhibit a larger variety of forest growth. The following list of counties will show an unusual proportion of woodland:

COUNTIES.	Per cent.	COUNTIES.	Per cent.
Alamance	34.8	Jackson	89.3
Alexander	74.1	Johnston	66.1
Alleghany	65.4	Jones	73.2
Anson	35.4	Lenoir	54.1
Ashe	72.5	Lincoln	47.8
Beaufort	84.7	Macon	85.8
Bertie	68.7	Madison	78.7
Bladen	85.8	Martin	73.1
Brunswick	91.7	McDowell	46.7
Buncombe	73.7	Mecklenberg	39.0
Burke	73.0	Mitchell	80.1
Cabarrus	37.4	Montgomery	61.1
Caldwell	71.9	Moore	73.4
Camden	37.3	Nash	69.8
Carteret	63.1	New Hanover	78.1
Caswell	28.8	Northampton	47.9
Catawba	21.7	Onslow	80.1
Chatham	48.5	Orange	37.9
Cherokee	59.6	Pasquotank	44.4
Chowan	54.3	Perquimans	53.3
Clay	76.8	Person	33.8
Cleveland	49.6	Pitt	63.9
Columbus	8.1	Polk	80.2
Craven	82.3	Randolph	67.0
Cumberland	85.3	Richmond	75.8
Currituck	52.7	Robeson	70.8
Dare	46.0	Rockingham	45.5
Davidson	41.8	Rowan	35.9
Davie	39.5	Rutherford	14.3
Duplin	76.3	Sampson	76.8
Edgecombe	52.4	Stanley	66.2
Forsyth	44.9	Stokes	64.0
Franklin	46.9	Surry	74.1
Gaston	52.2	Transylvania	85.2
Gates	64.7	Tyrrell	56.1
Granville	31.1	Union	58.8
Greene	59.9	Wake	46.1
Guilford	31.8	Warren	47.7
Halifax	55.9	Washington	68.4
Hanett	79.3	Watauga	80.4
Haywood	69.5	Wayne	63.0
Henderson	73.1	Wilkes	67.9
Hertford	66.7	Wilson	60.6
Hyde	48.8	Yadkin	49.7
Iredell	43.9	Yancey	77.0

The forest area of Georgia farm lands is still large—54.6 per cent. Seven counties—Bullock, Clinch, Coffee, Montgomery, Pierce, Telfair, and Ware—have over nine tenths in woodlands, the latter 97.4 per cent. The following table gives the proportion for each county in Georgia:

COUNTIES.	Per cent.	COUNTIES.	Per cent.
Appling	76.0	Jasper	19.4
Baker	50.5	Jefferson	54.9
Baldwin	25.8	Johnson	69.4
Banks	74.9	Jones	28.4
Bartow	54.2	Laurens	72.4
Berrien	65.6	Lee	50.0
Bibb	52.8	Liberty	80.6
Brooks	71.7	Lincoln	22.2
Bryan	79.8	Lowndes	62.1
Bullock	91.3	Lumpkin	78.2
Burke	47.0	Macon	50.6
Butts	36.6	Madison	40.2
Calhoun	60.0	Marion	50.1
Camden	80.2	McIntosh	69.1
Campbell	61.0	Meriwether	35.1
Carroll	58.9	Miller	69.5
Catoosa	62.0	Milton	52.7
Charlton	88.0	Mitchell	58.1
Chatham	73.5	Monroe	20.7
Chattahoochie	43.9	Montgomery	93.0
Chattooga	69.6	Morgan	17.1
Cherokee	69.3	Murray	71.6
Clark	21.8	Muscogee	36.3
Clay	59.5	Newton	41.2
Clayton	43.8	Oglethorpe	54.0
Clinch	91.8	Paulding	65.8
Cobb	56.1	Pickens	78.3
Coffee	95.0	Pierce	91.2
Colquitt	72.9	Pike	45.1
Columbia	29.4	Polk	56.4
Coweta	39.8	Pulaski	61.6
Crawford	43.0	Putnam	17.5
Dade	.7	Quitman	57.2
Dawson	78.7	Rabun	88.2
Decatur	65.6	Randolph	55.9
De Kalb	43.3	Richmond	54.0
Dooly	63.4	Schley	48.1
Dougherty	42.2	Scriven	70.6
Early	67.2	Spaulding	7.2
Echols	27.9	Stewart	39.7
Effingham	89.9	Sumter	50.5
Elbert	26.2	Talbot	36.7
Emanuel	9.0	Taliaferro	15.4
Fannin	81.2	Tatnall	56.3
Fayette	50.7	Taylor	67.9
Floyd	63.1	Telfair	91.4
Forsyth	53.3	Terrell	56.8
Franklin	59.2	Thomas	64.9
Fulton	55.2	Towns	57.3
Gilmer	.1	Troup	30.1
Glasscock	55.4	Twiggs	44.5
Glynn	77.3	Union	85.6
Gordon	71.7	Upson	51.1
Greene	20.6	Walker	61.3
Gwinnett	46.5	Walton	35.3
Habersham	46.8	Ware	97.7
Hall	74.4	Warren	21.4
Hancock	28.5	Washington	60.9
Haralson	58.6	Wayne	52.8
Harris	29.2	Webster	47.3
Hart	68.6	White	63.1
Heard	61.7	Whitefield	67.6
Henry	48.2	Wilcox	82.2
Houston	43.8	Wilkes	13.7
Irwin	00.0	Wilkinson	40.0
Jackson	48.5	Worth	76.1

FOREST TREE CULTURE.

Unquestionably one of the most important questions engaging the attention of the American people is that of forest culture. The demands of our rapidly growing country have for many years so drawn upon the resources of our native forests, which at one time seemed inexhaustible, that we must now contemplate their early extirpation, and address ourselves to the task of conserving what forests we have remaining, and providing new sources of supply.

Much has been written on this subject, but so difficult is it for us to realize the bearing of remote evils, that comparatively very few farmers or land owners have yet seriously engaged in the work of replenishing their woodlands. The arguments for this work are strong and numerous, and have been cogently presented by many writers. Many facts have been observed, which appear to show that the presence of forests has much to do with the rainfall and climate of a country; thus, it is said that the extreme dryness of Spain is due to the absence of trees; that many districts in France have been materially injured by denudation; that Palestine and many other parts of Asia and Northern Africa, which in ancient times were the granaries of the world, are now deserts or infertile regions in consequence of the loss of their forests. It is also stated that a beneficial change in climate and rainfall has in several instances followed the introduction of trees and plantations in regions that were formerly destitute of them. Thus, it is said that in Lower Egypt, where anciently rain never fell, the introduction and cultivation of extensive plantations have been attended with the fall of a good deal of rain, so that showers are no rarity, even at Cairo. It is also affirmed that in New England and other wooded sections, the clearing up of forests and cultivation of the soil have had the effect of causing the drying up of many springs and small streams.

There are some who doubt the correctness of these conclusions with respect to the climatic influences of forests; but, as these influences must be of very gradual operation and require observations over a long series of years, the question may be considered open for future inquiry. But, leaving that question out of view, there remain abundant reasons to stimulate every landholder in our vast prairie regions to give practical attention to the subject.

Trees are wanted for their fruits, for their shade, and protection from winds, for fuel, for use in building, fencing, and the mechanical arts. Some trees are adapted to one of these purposes, and some to another.

The earliest tree-want which is appreciated by farmers in a new country, is the want of fruit trees. Even this practical and personal need too often fails to stimulate the farmer to immediate action toward the formation of an orchard. But it is not with reference to the cultivation of fruit trees that we now design to write.

What kinds of forest trees shall we attempt to cultivate, is a question often asked, and toward the solution of which we propose to offer a few thoughts. In an open prairie region there is an immediate and urgent want of trees for shelter and wind-breaks. Both man and the domestic animals instinctively seek the grateful shade of trees during the intense heat of Summer, and as instinctively seek their shelter from the fierce winds of Winter. The intelligent farmer also knows that it is a question of positive economy, as the absence of suitable shelter must be represented by an increased consumption of food and fuel. Often, too, he finds that without some suitable wind-breaks he is unable successfully to cultivate the best varieties of fruit trees. He wishes to secure these advantages of shade and shelter at the earliest possible period, and hence he inquires for rapidly growing trees for cultivation. The great cost of fencing on the prairie, leads him to seek some suitable tree or shrub for the growth of hedges. It is true that many experiments in this direction have been attended with failure, but we should not be deterred from continuing our experiments until a suitable hedgeplant is found for every section of country. If the osage orange fails, let us try the honey locust, or some of our native thorn bushes, crab apples, wild plums, viburnums, or other shrubs or trees, until we meet with success.

The production of wood for fuel and mechanical uses is an object which, however desirable, has seemed so remote in prospect that it has been almost universally neglected. But even this neglect is to a great extent based upon too general and vague views as to the slowness of tree growth.

There are several species of trees which, with proper cultivation, will acquire a circumference at the trunk of eight to ten inches in five years' growth, and a few acres of such trees would soon furnish a constant supply of desirable fuel to farmers who now have to haul, at great expense of time and labor, a distance of from five to ten miles. Most of the rapidly growing trees produce soft wood, which is not much esteemed for fuel, but, for Summer use, when properly prepared, it must be equal, if not superior, to the corn-cobs, which are extensively used for fuel in the Western States. Many western farmers have cultivated their prairie lands for twenty years, and hauled their fuel from a distance, when, during that time, cottonwood trees of two feet diameter, white maple of eighteen inches, box elder of twenty inches, and butternut of eighteen inches, might have grown upon their lands, with a little labor and care.

The planting and cultivation of hard wood trees, suitable for building purposes and use in the mechanical arts, is one which has been almost wholly neglected in this country. It is a work which is too commonly regarded as being wholly for the benefit of posterity, and we are slow to realize that we have any duties in that direction. But the necessity of entering upon this work is apparent, for it is not difficult to contemplate the period when our natural forests shall have disappeared under the enormous demands which the progress of our country makes upon them. Some of the trees which, at the present time seem most deserving of trial for the purposes named, we will briefly notice.

Cottonwood.—In the Western States and Territories the name cottonwood is applied to the *Populus monilifera.* Groves of this tree are common on the streams which traverse the great plains and prairies. Near the base of the Rocky Mountains, however, as in the Platte bottoms, near Denver, two other species of poplar are associated with it in the groves, viz: the narrow-leaved cottonwood (*Populus augustifolia*), and the balsam poplar (*Populus balsamifera*). They are all large trees, of vigorous and rapid growth, and are readily propagated from cuttings. They are particularly recommended for wind-breaks and shelter for more tender and slow-growing trees. A belt of cottonwoods around a young orchard will undoubtedly save many trees from loss by frosts, and contribute to their thrift and productiveness. All the poplars are diœcious and objectionable for planting in the immediate vicinity of dwellings, on account of the abundant cottony down of the seeds, which fills the air after their maturity. This inconvenience can be avoided, however, by propagating from cuttings of the male tree only. Mr. Samuel Preston, of Mount Carroll, Illinois, writes to the department that for a wind-break he would substitute Lombardy poplar for cottonwood, as being more easily raised from cuttings, bears closer setting, has a more sightly appearance, has no cottony down to fill the air, holds its foliage much longer, and, therefore, is a much better wind-break to an orchard. At the time of his writing (October 14th), the cottonwoods were bare of leaves, while the Lombardies were full of foliage, and looked as fresh and green as in midsummer.

The maples.—For ornamental culture, for usefulness of wood, and for vigor of growth, there are few trees so worthy of attention as the silver-leaved, or white, and the red, or swamp maple. In the Western States the red maple is comparatively rare. The white helps diversify the forest growth on the bottom lands of most of the western rivers, and is largely planted as a shade tree in the cities. A serious objection to its cultivation is, that its long, slim branches are liable to be broken by storms of sleet and snow. This difficulty could be obviated by a judicious shortening in of the branches. In some parts of the West it has suffered severely from the ravages of a borer, which penetrates the trunk. The red maple is more compact, and somewhat less rapid in its growth, but is deserving of large planting.

Hard maple, or sugar maple.—For beauty of form, for its close and dense foliage, for the value of its wood, and of its saccharine juice, no cultivator should neglect the sugar maple. In the whole family of maples, whether native or foreign, this species is without a peer. It is a little shy of transplanting, and for the first few years is of slow growth, but when it is established it is worth many times its cost. Several foreign species of maple are cultivated for ornament and shade in the eastern cities, but they present no advantage over our native ones.

Box elder (*Negundo aceroides*).—This tree rivals the cottonwood in rapidity of growth, and is deserving of particular attention, combining not only the qualities of rapid growth, of hardiness, of handsome foliage, and a good quality of wood, but having also great promise as a sugar-producing tree. Some investigations made in Illinois, with reference to its value for sugar, are reported to decide: First—That it produces more sap than the sugar maple of equal size, half a gallon per day being obtained from a small tree of three and one half inches in diameter, and five years old. Second—That the sap is richer in sugar, the yield of dry sugar averaging 2.8 per cent of the weight of the sap. Third—That the sugar produced is in general whiter than that from sugar maple, treated in the same way. These facts should recommend this tree to the early attention of all tree planters, especially in prairie regions.

Ailanthus.—The ailanthus appears to be one of the most promising trees for cultivation in the West. It thrives well, even on hard and stony soils. It is a native of China, but has for many years been cultivated in Europe and in this country. It approaches in botanical affinities nearer to the wafer ash, or hop tree (*Ptelea trifoliata*), than to any other tree of this country. It produces flowers of two kinds, generally on different trees. The male flowers are produced in large panicles, and are of a greenish yellow color, and very disagreeable odor, which circumstance has made it quite unpopular as a shade tree in cities. This, however, would not be a serious objection to its cultivation as a forest tree. The wood is hard and fine grained, and well adapted to cabinet work. It is also good for fuel. In France and Southern Europe it grows to a large size on chalky soils where few other trees would live. It has been largely planted on the plains of Southern Russia, to fix the loose, blowing sands. North of latitude forty degrees it will probably be too tender for profitable culture. It is easily propagated, either from seeds, suckers, or root cuttings. It was introduced into this country under the name of "tree of heaven," and is indeed a beautiful tree, when in full foliage.

Ash.—We have five or six native species of ash, all of which are ornamental and useful trees; but two species, the white and the blue, are especially valuable, and should be among the kinds planted by every cultivator. The timber of the ash is adapted to a great variety of uses, particularly in the manufacture of farming tools. On account of the great demand for this timber for agricultural implements, for carriages, and furniture, it is becoming scarce, and its cultivation promises to be very remunerative at an early day. The white ash becomes one of our largest forest trees, attaining the height of seventy or eighty feet, with sometimes a diameter of three feet at the base. The wood is white, and remarkable for its toughness and elasticity. For these qualities it is used for hoops, pitchfork and rake handles, and for wagon shafts. Emerson relates that an ash tree in Granville, Massachusetts, was rived into three thousand rake handles. It was four and one half feet in diameter, and had a shaft of seventy feet without a limb. The white ash requires a deep, moist soil, for its greatest perfection. Most prairie soils are well adapted to its growth. It bears transplanting well, and is remarkably exempt from the attacks of insects. The blue ash occurs in the bottom lands of the Western States. It may be readily distinguished by the young shoots being square or sharply four-sided. The wood is said to be more durable even than that of the white ash, especially when exposed to the weather, as for fence posts, stakes, and rails. This species has a southern, and the white ash a northern range. The seed of either may be sown in the Fall, thinly covered with earth, and lightly mulched with straw, or it may be sown in the Spring, after being mixed with moist sand, and exposed for a few days to a warm sun.

The walnuts.—The black walnut is a timber of so much importance in cabinet work, and is becoming so scarce by the constantly increasing demand, that no tree cultivator should neglect to give it a place in his plantation. The tree begins to bear fruit at an early age, and the nuts, which resemble those of the English walnut, are much esteemed by most persons

The white walnut, or butternut, furnishes a wood of similar texture, light brown, fine grained, and easily worked, but not so ornamental as the preceding. The walnuts do not transplant well, and, therefore, the nuts should be planted where the trees are to remain. From the seed they grow vigorously, especially the white walnut, which almost equals the soft maple in thrift.

The American chestnut.—This is one of the finest in appearance, and one of the most useful, both for the value of its timber, and for its valuable fruit, of our native trees. The difficulty of transplanting the young trees has hindered its cultivation. It is found chiefly in hilly and mountainous districts, and for successful cultivation should at least have a dry, well drained subsoil. Mr. Preston, of Mount Carroll, Illinois, says:

"It has been generally supposed that the chestnut could not be successfully raised upon our prairies. But my experience, and that of others, proves it to be a mistake. I have them seventeen years old, and bearing nuts, and some of the trees are twelve inches in diameter. They grow faster than the butternut, which I also have of about the same age. I have never succeeded in transplanting the chestnut, while I have transplanted the butternut, with a loss not to exceed two per cent."

The elms.—Of our elms, the white and the red are the most important. For an ornamental tree for parks, lawns, and streets, they have a national reputation. They are hardy, grow with tolerable rapidity, and are readily transplanted at almost any age. The wood of the white elm is rather inferior in quality; that of the red is stronger and more durable, and is much used for the manufacture of wagon hubs, carriage wheels, etc.

The white willow.—Notwithstanding the prejudice which exists against this tree, on account of the extravagant representations made of it a few years ago, as a hedge plant, it deserves attention from its rapid growth, as well adapted for wind-breaks and screens. It may be planted in low grounds which are unsuited for most trees, and will thrive best in such situations. Its light and graceful foliage affords an excellent contrast with most other deciduous trees, and in places where fuel is scarce, it is deserving of cultivation for an early and abundant production of wood.

Evergreens.—By evergreens is commonly understood the family of coniferous trees, because in northern latitudes these are the only trees which retain their foliage throughout the year. The deciduous trees give us shade and shelter during the Summer; but in our prairie regions, during the coldest half of the year, they are leafless and afford only partial protection from the fierce blasts of Winter. This consideration alone should recommend the cultivation of evergreens to every dweller upon prairie soil, for not only is the comfort of man and beast concerned, but also practical economy, as it is well known that the abstraction of animal heat by cold winds must be counterbalanced by an increased supply of food. But the fact that these coniferous trees furnish our most valuable building material, that our native supply of them is rapidly diminishing, and the market value advancing, affords strong and urgent argument for the attention of tree-growers.

Pines.—The white, Austrian, and Scotch pines, are considered the best for general cultivation. Mr. Bryant says of the white pine:

"No one of our native forest trees is more generally useful, and no one better merits careful preservation and extensive culture. As an ornamental tree, it is surpassed by few, if any, of the genus. Its foliage is soft, its hue agreeable, and the whole appearance of the tree graceful."

The Scotch pine is one of the most rapidly growing species, and succeeds in very variable soils, being perfectly hardy, even in the most northern parts of the country. It bears transplanting with more facility, perhaps, than any other species. Its thick, dense foliage adapts it well for screens or belts for the protection of orchards. On account of its rapid growth, its valuable wood, its hardiness, and its adaptability to different soils, it is strongly recommended for cultivation. The Austrian pine has much resemblance to the Scotch, having longer leaves, of a darker color. It grows vigorously, and from its stiffness and strength resists the most violent winds, and does not suffer under the heavy accumulations of sleet and ice, which sometimes greatly injure more slender species. It has been extensively planted for ornamental purposes, and although rigid and ungraceful in habit, its dense and dark foliage in Winter renders it very pleasant to look upon.

Spruce or fir.—The white and black spruces, the Norway spruce, and the hemlock, or hemlock spruce, are the most important species of this genus, *Abies*. The Norway spruce in particular, has been highly recommended by several western horticultural societies as the most suitable tree for belts for the protection of orchards. It is perfectly hardy, bears transplanting, is vigorous in growth, and adapted to all common soils. The white and the black spruces are among the most valuable ornamental evergreens, and their presence in the vicinity of the farm house or dwelling is at once an evidence of taste, and adds materially, not only to the market value of a place, but presents agreeable objects for the eye, and relieves the dreariness of the Winter landscape.

Among ornamental evergreens, perhaps none is more deserving of a place than the hemlock. Its delicate light green and silvery foliage, and slender, drooping, graceful branches, form a pleasing contrast with the stiffer and more rigid pines and spruces. Perhaps, on account of its commonness in the Northern and Eastern States, it has been neglected as an ornamental tree. Mr. Meehan says of it, that it would be no exaggeration to pronounce it the most beautiful evergreen in cultivation. It has been recommended as a screen, or ornamental hedge, but for this purpose there is probably no evergreen equal to the arbor vitæ. This bears close planting, may be pruned into any desired shape, and forms a dense, compact wall, of the deepest green. The Siberian and Chinese arbor vitas are considerably cultivated, and may, perhaps, suit some localities better than the American.

The larch.—The larch, although not an evergreen, is a coniferous tree, possessing the same general characters of structure and fructification as those we have mentioned. The American and the European are the two species which are known in cultivation. The European larch has of late years been very highly, perhaps extravagantly, recommended for general cultivation as a timber tree on the western prairies. It has, indeed, many valuable qualities, being a very rapid grower, possessing a pleasing symmetry of form, and furnishing a wood of great value and adapted to a great variety of uses. Extensive plantations of it have been formed in Scotland, which have proved highly successful. The plantations of the Duke of Athol, in that country, are everywhere famous, and have stimulated to extensive planting of this tree in other countries. It has been here tried sufficiently to prove its value as a rapid, vigorous grower, hardy and beautiful, but the wood grown here has not been sufficiently tested to fully decide on its merits. Recently, Professor Matthews, of the Iowa Agricultural College, has thrown out some doubts about the durability of the wood grown upon the western prairies. It seems highly probable that the quality of the timber is affected more or less by soil and climate. Loudon says that "a certain elevation of surface, coolness of climate, and inferiority of soil, are absolutely necessary to produce the timber in perfection." On broken hills, bluffs, and slopes, it can probably be grown with great profit. The American larch very closely resembles the European, having smaller cones and shorter and paler leaves. Its natural situation is in cold swamps in the northern portions of the United States, where it is known as tamarack, or hackmatack; but it seems to succeed well on high and dry soils. Many contradictory statements have been made as to the value of the timber, some considering it even superior to the European species, others accounting it of little value. Mr. Lapham, of Wisconsin, says:

"Those who desire to make plantations of the larch should take into consideration the character of the land to be planted; if it be wet, then the American larch should be chosen. It is a tall, slender grower, with coarse-grained, durable, and valuable wood, wherever light, straight timber, such as hoop-poles, is required."

The variety of our forest trees is very great, and undoubtedly there are many other kinds which are equally entitled to cultivation with those we have named. Forest culture is yet in its infancy here, and we should go on experimenting and observing, until we learn what are the most profitable and useful kinds.

FOREST CULTIVATION ON THE PLAINS.

THE CLIMATE AND CULTIVABLE CAPACITY OF THE PLAINS CONSIDERED IN REGARD TO THE AMELIORATIONS POSSIBLE THROUGH GREATER PROTECTION BY FORESTS.

BY LORIN BLODGET.

The existence of forests in a state of nature over almost the entire area occupied by civilized nations is strong, if not decisive, proof that they hold relations to the soil and surface that cannot safely be disregarded. In such parts of the Old World as have been wastefully occupied in this respect, and where the native forests have been wholly removed and the surface denuded, there has been a great waste of the ancient fertility of the soil, and often an exhaustion, if not an absolute destruction, of the nations that once flourished in those countries. Arabia, Palestine, and various parts of Asia Minor, with parts of Greece, and Turkey in Europe, are illustrations of this waste and ruin in the east, while Spain is, perhaps, the most striking example in the west. It is indisputable that the powerful nations that for centuries occupied those countries first rose to strength on the natural wealth of soil and forests which originally occupied the surface; and their decline and exhaustion were at least coincident with the waste and denudation of the country. The lands became less and less productive, and arid plains only remained where general cultivation and dense populations long existed, until finally the exhausted surface would maintain no greater population than we find occupying it now. A long process of vigorous and constant effort to restore what has been destroyed, can alone make those countries what they were, even within the best known periods of history, and this course their enervated people are not likely at any early day to attempt.

The greater part of the surface of the United States was originally covered with a forest growth remarkable for its uniformity, for the magnificent size of the trees themselves, and for its decisive influence on the local climate, as well as on the condition of the surface soil. Lands which, after clearing and cropping for thirty years or more, appear hard, refractory, and liable to destructive droughts, were originally entirely free from either of these conditions, and, within the personal knowledge of many of their present occupants, were amply supplied with moisture, as well as loose and fertile in character of surface for cultivation. No observant person can fail to be impressed with the importance of arresting the progress of these changes, and most persons have no hesitation in tracing these results to the removal of forests. Careless cultivation has much to do with it, undoubtedly, but worse than that is the loss of the protection forests give, and the steady supply of moisture to the soil which their presence secures.

It is, in fact, only recently that settlements have extended beyond the limits of the vast primeval forest extending from the Atlantic nearly to the Mississippi River. Within a comparatively few years we have come to occupy a surface quite novel to the first experience of our people, in the prairies and the plains. They have been a problem to us from the beginning, one not easy of solution from the point of our previous knowledge. As a contrast with the forests, which were the natural covering of the surface, the difference was so great as to imply essential differences of both soil and climate, since it could only be explained by supposing that neither soil nor climate permitted trees to grow.

But a very brief period of actual occupancy has put a very different construction on the case as a whole, and the partial incredulity at first existing as to the possibility of growing forest trees has almost wholly disappeared. It has been found that neither of these conditions presents any obstacles that cannot be promptly overcome on the prairies proper, or the plains nearer the Mississippi, which are called by this name. These prairies are, apparently, no more than natural fields or clearings, preserved from growing up to timber chiefly by the annual fires and the existing turf which covers them. If once the surface is broken, and the fires are restrained, they are immediately covered with natural growths of some form of forest trees, possibly not the best or most valuable, but such as at least serve to vindicate their capacity to grow any ordinary forest trees.

The absolute origin of the prairies is obscure; it may be simply the constant invasion of the forest by fires starting on the distant and dry interior, and carried eastward by the prevalent westerly winds. Certainly the great tertiary formations of the country west of the Missouri were brought to their present condition as plains, and were undoubtedly exposed to the same general conditions of exposure they now present. On these the forests could scarcely get a footing so strong as to maintain themselves with severely trying winds sweeping over them from the west. They therefore continued to be the plains they were in the beginning, and the districts bordering them at the east were always invaded by the destructive agencies originating at those western limits. The agency of savages is well known to be as destructive in the matter of kindling fires as the presence of civilization, and for ages, therefore, the greater body of fertile and well watered lands, now described as prairies, have been swept of their covering of vegetation annually, as far as fires could effect its destruction.

The plains and prairies are in an unnatural condition of denudation and exposure if these views are correct. The first question is to inquire whether any agencies in our power to control can be employed to restore what is wanting, and to protect what we still have from further destruction. An Act for the restoration and preservation of forest trees is the first and most effective step that is suggested. The power of the General Government can, to a great extent, control the conditions under which the lands may be taken up, and this power, directed wisely, will not be to the prejudice or injury of any class of occupants of the soil. The existing difficulties of climate and surface are their greatest obstacle, and if general improvements are practicable through prompt legislation and united efforts, the first to receive the benefits will be the settlers themselves. In these views, a bill prepared by the honorable Commissioner of Agriculture, in eighteen hundred and seventy-three (H. R. No. 3008, second session Forty-second Congress), provided effectual guarantees; first, for the preservation of existing timber; second, for the planting of a certain proportion of all lands sold or granted on which such proportion does not naturally exist; and third, the general planting of tracts of unsold lands, in the least protected districts, by the direct agency of the General Government. And to afford settlers and occupants special inducements to such planting, lands to the extent of a quarter section would be given to a settler who should plant and cultivate so much in forest for five years.

That all these powers and requirements are within the authority of the General Government to exercise and enforce, cannot be doubted if the exigency is so general and important as to demand them as a condition of successful occupancy of the soil itself. The lands of the plains generally certainly cannot be sold to realize any revenue to the Government without some such provision. If granted or conveyed without sale, it is doubtful whether they can be occupied, and thus the primary duty of providing for their safe occupancy fails to be discharged by the Government.

Undoubtedly the first among the questions to be considered is the possibility of the improvement and the ameliorations proposed to be effected. If tree planting is itself impossible, or if no practical amelioration of soil or climate results from it, the exercise of compulsory powers would at least be of doubtful propriety. For these reasons it is proposed here to treat the question apart from any doubtful or disputed propositions on this general subject, and to consider fairly whether portions which admit of no doubt, and are not open to question anywhere, do not fully sustain the general principles of the measure proposed in the Commissioner's bill.

The mutual relations of surface to climate cannot be disputed, and they must be considered fairly in any discussion of the modes of restoring better local conditions, or of averting further deterioration. The greatest of all agencies for the retention of water on the surface, wherever falling, for promoting its absorption and penetration of the soil, and for rediffusing its vapor in the atmosphere, is what we designate as the native forest. Forests are, in nature, the growth of centuries under conditions generally favorable; and they resist, for periods equally long, the action of even unfavorable conditions. When destroyed, they are not readily restored through natural agencies, and the denuded surface changes materially in the direction of aridity, and in the waste of nutritive elements in the soil. And the destructive power of extreme seasons of drought, of fire, and of special acts of man, in a savage as well as in a civilized state, is such that no conclusions adverse to the possibility of forest-growth can be drawn from the absence of such growth on any part of the plains yet explored.

This last point is so important to the subject of this inquiry that it should be further elucidated. It was an early and common error at the first occupancy of the prairies of Indiana and Illinois to infer that some inherent difficulty in the soil or climate prevented the growth of forests on them. Yet experience very soon proved that no more prolific soil, or more favorable conditions of climate, existed in the world to favor forest growth. Special adverse influences, which we cannot yet fully understand, alone prevented the growth of forests on these prairies originally. Local peculiarities had, indeed, crept in which could be controlled only by the intervention of energetic efforts of men associated either as individuals, or through legislative action. The stiff prairie soil was itself the growth of centuries, and the annual fires had become as inevitable, almost, as any feature of the climate. While these continued no forests could spring up on the prairies and retain their hold unaided, however perfect the adaptation of soil to forest growth.

Passing westward from the prairie districts, as they are generally known, we enter by insensible gradations on the surface of the plains. The long standing belief that great absolute change of soil, or change from soil to desert sands and rocks ensued, has been dissipated, as before stated. Anywhere on the road to Denver and the foot of the mountains the most recent and ample testimony is that water alone is needed to make the surface productive under cultivation. And perhaps the most remarkable of the favorable facts developed is that which shows that sage brush and alkaline soils mean little or nothing more than that the requisite Spring and Summer rains are deficient. With a restoration of these rains, or with irrigation enough to compensate for them, the surface, previously covered with saline efflorescence, and having a forbidding aspect under a sparse and stubborn growth of sage or grease weed, at once yields ample and constant crops of wheat and every other grain. It is a gratifying relief to find these, and valleys and plains, a few only of which are to be seen east of the summit ranges of the Rocky Mountain plateau, but which are abundant and general in the basin districts of Utah and Idaho, are all within easy control of energetic settlers, and all can be turned into almost gardens of fertility, when irrigating streams are within reach.

But the specially adverse feature of the plains is the absence of forests and timber. All the surface east of the mountains is and has been especially exposed to the destructive local and general influences which have kept forest trees from the prairies of Illinois and the adjacent States. And with this wholesale denudation has come an undoubted exaggeration of all the extremes of climate natural to the latitude. The winds of the Spring and Summer sweep over vast stretches of surface which afford little or no evaporation to mitigate their dryness, and they therefore become excessively dry. The rains which fall, even profusely, at certain seasons, chiefly in the Spring, are thrown rapidly off from the dry turf of the surface; and a sudden flood of the upper rivers of the plains may be followed in twelve hours by winds entirely dry, and which, in sweeping over the surface, get little or no accession of moisture from the rain which fell profusely but a day before. The natural moisture of the climate is therefore wasted, and in consequence of this waste is insufficient to sustain the first efforts at cultivation.

Under these general views it is clear that the practical problem of improving the plains, and even the basin districts of the interior of the continent, opens very favorably. In one mode or another it is certain that the greater part of the surface can be brought under cultivation, and its value can be vastly enhanced over the previous general belief as to such value. Geological research has greatly enlightened us as to the origin of the strata which make up the general surface, and the plateaux and mesas are nowhere more forbidding or barren than the plains or valleys. In the immediate mountains, also, great numbers of instances appear in which, as in the Uintah Mountains, the high lateral ridges are composed of nearly horizontal strata, with a level surface, and the ridge or declivity is wholly one of denudation through an originally level mass.

Grazing tracts and forest belts of singular luxuriance lie along these summits and ranges, and these have a great value directly available in the immediate occupation of the country.

The actual climate of the plains and basin districts has now been very closely determined by scientific observation. The most valuable agency has been that of the military posts, at all of which careful records are kept of the quantity of rain falling, as well as of the temperature, and often of the humidity, winds, and other conditions. At the eastern border, and at a few localities further west, individuals have kept equally valuable records, from the whole of which a close approximation to a positive climatology may be deduced. From these it appears that the rainfall of every season continues abundant as far westward as the ninety-eighth meridian, nearly. In Kansas, on the Arkansas and Kansas Rivers, the dry surface begins soon after passing Council Grove and Abilene, and from Fort Zarah to Fort Reynolds, on the Arkansas, a distance of three hundred miles, the country is very dry. On the Kansas River, from Salina to the sources of the Smoky Hill Fork, and beyond these to Denver, the deficiency of rain is considerable, but not so great as on the Arkansas. On the Platte, from Fort Kearney to the foot of the mountains, the like deficiency exists, but still less than on the Kansas, the degree of deficiency being less on going northward. Again, on the line of the Canadian River, at the thirty-sixth parallel, there is less deficiency of rain than on the Arkansas at the thirty-eighth, to whatever cause this may be due. In the "Bad Lands" of Nebraska and Dakota, and in the valleys east and south of the Black Hills, there is a material deficiency of rain, but on the upper plains of the Missouri, the Yellowstone, and other rivers northward, the deficiency in Spring and Summer is not so great. The deficiency here spoken of is more definitely the sensible deficiency experienced in cultivation or shown in the vegetation and surface evidences than the measured deficiency in quantity falling. It is a striking fact that the actual quantity falling, as shown by the rain gauge, would, in most climates, be considered ample. At Fort Kearney, on the Platte, for instance, at the very border of the arid region, as generally described, the quantity of water falling in Spring and Summer is one half greater than that falling in the same seasons on the border of Lake Ontario, New York.

LOCALITY.	Years.	Spring.	Summer.
		Inches	*Inches*
Fort Kearney, 99° west longitude	11	9.52	11.35
Oswego, New York	8	6.18	7.63
Niagara, New York	10	6.87	9.81
Fort Laramie, 104° 47′ west longitude	10	6.25	5.09
Fort Riley, 96° 25′ west longitude	6	6.48	9.37
Fort Randall, 98° 12′ west longitude	3	4.93	7.16
Denver, 104° west longitude	2	5.51	1.00

Here we see that no western post is greatly deficient in Spring rains as compared with Central New York, and only Denver and Laramie are materially deficient in Summer rains.

These facts are very striking, and on examination they are found to characterize the entire area of the plains at the most critical season for vegetable growths, the three months of Spring; and, in fact, the month of June is also included. It has long been known that many of the rivers of the plains have floods in May and June; this is especially true of the Kansas, which has its rise in a secondary tract of high lands, a hundred miles east of Denver, and of the general line of the foot of the mountains. Recent observation shows that this tract is quite well watered in Spring and early Summer, at least in contrast with the line of the Arkansas, and with the overshadowed valleys at the very foot of the mountains. It is sufficient proof of this profusion, that the entire volume of the Republican Fork, Solomon's Fork, and Smoky Hill Fork, of the Kansas River, as well as of several tributaries of the Platte on the north, and the Arkansas on the south, is derived from this isolated area. The water thrown off from this tract, four degrees of longitude in length, or from one hundred degrees to one hundred and four degrees west longitude, and two degrees of latitude in width, thirty-eight and one half degrees to forty and one half degrees north, is fully as great as the average water drainage of an equal area in Michigan or New York.

The characteristics belonging to it, undoubtedly, are simply those of profuse rainfall and too rapid drainage to the river beds. There being no forests, and little or no such abundance of other vegetation on the surface as would serve to arrest and diffuse the rain, either by absorption into the soil or by retention in swamps, grass, or wood lands on the surface, the chief value derivable elsewhere from such profusion here disappears. In this tract, surrounded as it is by plains of such extent as to prevent any protection from prairie fires, there has really been no chance in a state of nature to attain forest growths. The narrow line of cottonwoods and willows at the river borders was only preserved by being almost in the water, and however adequate the natural rainfall to sustain forests, there was still no chance for them without the protection of man. On this extension of prairie soils and uniform surface, where every acre is really arable land in the fullest sense, would appear to be the most favorable spot for initiating practical measures to intersperse forests with cultivated fields. Two or three great railroad lines traverse it, affording ample means for communication and the support of settlements. Establishments on the northern and western borders of such a tract are essential, and here they are easily made; indeed, they are to some considerable extent made already, the line of the Union Pacific Railroad, and its branch to Denver, being already a line of not distant settlements, and of possible complete connection of protecting establishments.

The precise quantity of rain falling on this district should be ascertained. To do this, observations must be taken at the sources of the Smoky Hill and Republican Forks of the Kansas River, about one hundred and three degrees west longitude, and also on the South Platte and its tributaries. It is probable that the whole territory intervening between the Platte and the Arkansas is better watered than the immediate valleys of either of these rivers. In attempting to determine the quantity for the plains generally, we have a great abundance of observations in Kansas, Nebraska, and Minnesota, the most conspicuous feature in all cases being the profusion of rain from May to July. Generally, in Kansas, the Summer aggregate is greater than in any locality or State of its latitude eastward to the seaboard. This average ranges from fifteen inches at the eastern to eleven inches at the western border of the settled portion, at ninety-seven degrees west longitude. At Fort Kearney, on the Platte, two degrees farther west, the quantity for Summer is also eleven inches, with a quantity in May even more abundant. Indeed, at all these stations, while the first three months of the year are very dry, April begins to be profuse, and May to July are always profuse in rainfall. The abundance of rain is simply attendant on the advance of the season, and in Northern Texas, where March and April are the growing months, the rains are then most profuse. In the Indian Territory March begins the season; in Southern Kansas, April; and in Nebraska, May. The following table, giving the best results of observation of rainfall, may be given here as a more convenient place for reference than elsewhere:

DEPTH OF WATER FALLING IN RAIN AND SNOW (IN INCHES AND HUNDREDTHS) AT VARIOUS STATIONS ON OR NEAR THE PLAINS.

STATIONS.	Latitude....	Longitude..	Altitude....	Years.........	January	February ...	March	April	May...........	June	July...........	August.......	September..	October......	November.	December..	Spring.......	Summer....	Autumn.....	Winter......	Year ....
	° ′	° ′	Feet																		
Fort Towson..................	34 0	95 33	300	14	3,19	2.99	4.38	5.33	5.84	5.78	4.62	3.96	3.41	4.59	4.23	2.84	15.55	14.36	12.23	8.94	51.08
Fort Arbuckle..............	34 27	97 09	1,000	9¾	0.89	2.98	1.12	2.39	4.46	3.16	3.13	4.12	3.38	2.08	2.97	1.57	7.97	10.83	8.43	5.44	32.69
Fort Belknap................	33 08	98 48	1,600	5 5-6	0.47	2.29	1.32	0.88	4.21	3.98	2.49	2.97	2.77	2.92	2.65	1.10	6.41	9.44	8.34	3.86	28.05
Fort Scott, Kansas.......	37 45	94 35	1,000	10¼	1.92	1.18	1.79	3.70	7.08	8.13	4.55	3.69	2.30	2.66	3.46	1.69	12.57	16.37	8.42	4.79	42.15
Council Grove...............	38 40	96 30	1,200	6	1.17	2.31	1.81	3.16	5.14	5.33	5.19	6.39	4.59	3.11	1.75	1.14	10.11	16.91	9.45	4.62	41.09
Manhattan	39 15	96 40	1,100	9	0.52	1.63	1.36	3.10	2.37	4.86	4.90	3.52	3.35	1.69	1.52	1.06	6.83	13.08	6.56	3.21	29.69
Fort Riley	39 03	96 35	1,300	14	0.77	1.01	0.75	1.74	3.01	3.93	3.00	3.22	3.09	1.21	1 15	0.74	8.50	10.15	5.45	2.52	23.62
Fort Atkinson	37 47	100 14	2,330	1	0.04	0.49	0.96	3.38	9.34	4.35	3.00	2.80	3.85	6.81	1.39	1.60	13.68	10.15	12.05	2.13	38.01
Bellevue, Nebraska.....	41 20	95 57	1,250	8	0.89	1.57	0.79	1.92	3.76	3.58	3.91	3.82	3.18	1.76	1.36	2.10	6.47	11.31	6.30	4.56	28.64
Omaha Mission............	42 05	96 10	1,500	6½	1,03	0.84	1.42	2.56	4.42	3.00	4.42	3.57	3.06	1.68	1.67	1.13	8.40	10.99	6.41	3.00	28 80
Fort Kearney........	40 38	98 57	2,360	14¼	0.59	0.43	1.25	2.26	4.30	3.69	4.74	2.70	2.29	1.57	0.97	0.46	7.81	11.13	4.83	1.48	25.25
Fort Randall................	43 01	98 12	1,456	8 5-6	0.49	0.42	0.99	1.10	2.67	2.30	1.78	2.56	2.43	1.09	0.47	0.30	4.76	6.64	3.90	1.21	16.51
Fort Laramie...............	42 12	104 31	4,519	12½	0.61	0.46	0.84	1.06	3.74	1.90	1.63	1.37	1.17	0.97	0.84	0.57	5.64	4.90	2.98	1.64	15.16
Denver	39 40	105 10	5,500	2	0.81	0.97	1.26	2.80	1.45	0.29	0.51	0.20	2.85	0.54	1.82	0.75	5.51	1.00	5.21	2.53	14.25
Fort Lyon	38 08	102 50	4,000	1	0.32	0.12	0.16	2.09	4.84	1.40	2.53	0.37	0.04	0.00	0.07	0.15	7.09	4.30	0.11	0.59	12.09
Golden City.................	39 45	105 20	5,240	1	....	1.00	1.40	2.80	5.40	2.10	2.37	0.45	2.20	....	....	....	9.60	4.92	....	....	....
Fort Massachusetts......	37 32	105 23	8,365	5	0.34	0.86	0.61	1.15	1.19	0.71	2.01	2.84	1.80	0.87	3.61	1.07	2.95	5.56	6.28	2.27	17.06
Great Salt Lake City...	40 46	112 06	4,320	5⅔	1.68	2 25	2 47	1.39	1.34	1.49	2.54	1.01	1.37	2.20	2.35	3.76	5.20	5.04	5.92	7.69	23.85
Camp Douglas.............	40 39	111 42	4,800	3¼	2.77	1.53	2.87	1.11	1.58	0.60	0.84	0.60	0.99	1.79	1.71	4.18	5.76	2.04	4.49	8.48	20.57
Fort Defiance	35 43	109 10	6,500	8½	0.98	0.70	0.84	0.67	0.52	0.74	2.44	2 73	1.86	0.70	1.16	0.87	2.03	5.91	3.72	2.55	14.21
Fort Ruby....................	40 01	115 35	5,922	1¾	2.24	0.23	1.63	1.57	2.04	0.59	0:59	1.82	0.53	3.33	0.94	1.76	5.24	3.00	4.80	4.23	17.27
Deer Lodge City..........	46 15	112 30	6,000	2¾	1.45	1.81	1.64	1.40	2.28	1.97	0.58	0.58	0.86	0.48	1.38	0.49	5.32	3.13	2.72	3.75	14.92
Helena..........................	46 45	111 50	4,150	1⅛	2.12	0.43	1.15	1.80	4.30	3.50	0.07	0.20	1.80	2.61	0.50	1.00	7.25	3.77	4.91	3.55	19.48
Fort Benton.................	47 52	110 40	2.674	1½	1.01	0.37	1.11	1.81	2.86	1.14	4.62	0.61	1.82	....	....	1.30	5.78	6.37	5.00	2.68	19.83
Fort Sully....................	44 39	100 40	1,491	½	....	....	....	....	2.98	2.34	6.48	1.53	0.21	....	....	....	....	10.35	....	....	20.00
Cheyenne.....................	41 12	104 42	6,000	1	0.02	0.27	6.38	1.61	1.99	1.84	3.90	2.05	1.03	....	....	....	3.98	7.79	....	....	16.00
Corinne	41 30	112 18	5,000	1	0.70	2.42	0.55	1.43	2.66	0.47	0.11	1.04	0.14	0.35	3.22	4.04	4.64	1.62	3.71	7.16	17.13

The above table affords unexpectedly favorable results, particularly in regard to the critical seasons of Spring and Summer. Of more than twenty stations near or on the plains, but two or three show marked deficiency of rain, even in Summer; and in Spring, April and May at the south, and May and June at the north, are always marked by a fair amount of rain.

There is, it is true, need of observation at a much greater number of places, and conducted for longer periods. A few years more of the present fullness of observation will warrant more decisive judgments as to the quantities anywhere at hand to be utilized in some way more than is done at present. If, at the localities of Fort Atkinson, Fort Kearney, and Fort Sully, on this side of the plains, a Summer aggregate of ten inches or more is to be relied upon, and at Fort Lyon, Golden City, Laramie, and Cheyenne, five to seven inches can be relied upon for the same season, the assurance is certain that forest growth may be anywhere maintained after the first efforts and dangers of planting are past. Comparing these quantities with the records of rainfall in Europe, the facts appear in a still more striking light; the whole interior, and indeed much of the west of Europe, having a small quantity of rain. The following are condensed results by seasons, and generally derived from long periods of observation:

LOCALITY.	Spring.	Summer.	Autumn.	Winter.	Year.
	Inches.	*Inches.*	*Inches.*	*Inches.*	*Inches.*
London, England	4.09	6.00	6.15	4.45	20.69
Marseilles, France	4.67	2.17	8.00	5.23	20.16
Berlin	5.66	7.21	5.45	5.24	23.56
St. Petersburg	2.89	6.73	5.11	2.93	17.65
Simferopol, Crimea	3.22	6.01	3.40	2.20	14.83
Lougan, South Russia	3.57	4.99	3.02	2.28	13.87

The whole central area of Europe exhibits like small quantities of rain, and the simple measurements of quantity on the plains of the United States by no means sustain the idea that such aridity exists as to require irrigation. Yet the small number of rainy or cloudy days, and the sudden outflow of the water in streams, as well as its rapid evaporation in the somewhat caustic atmosphere that sweeps over the plains, reduce the practical value of the rain falling to little more than half the quantity when deposited elsewhere. At Niagara and Rochester, New York, the quantity of rain in Spring is less than seven inches, and that of Summer eight and one half to nine inches only. At Council Grove, Fort Riley, and Fort Atkinson, positions reaching westward from the settled border of Kansas, the quantity is fully equal to, or exceeds, that at Rochester. Even at Golden City, Fort Lyon, and Denver, it is nearly equal in Spring, though deficient in Summer.

Several instances of especially favorable results in the rainfall of single months for the year eighteen hundred and seventy-two, are afforded at the stations of the War Department Signal Service on and near the plains; among which are the following, showing very ample rains at the critical months, April to July (quantities in inches):

STATIONS.	April.	May.	June.	July.
Denver	2.09	3.74	2.07	2.69
Corinne	1.43	2.66	0.47	0.11
Cheyenne	1.61	1.99	1.84	3.90
Virginia City	0.35	1.78	0.74	2.73
Fort Sully	No obs'n	2.98	2.34	6.48
Fort Benton	0.67	0.64	1.14	4.62
Omaha	3.84	6.35	3.91	6.36

The records at all points of observation are unfortunately too brief to afford any proper means of determining whether the quantity of rain is greater now than it was ten years since; though great force attaches to the almost universal belief in such increase on the part of the more intelligent residents and observers in the interior. The range of non-periodic variation is very great in all parts of the temperate latitudes, and it is possible that our earliest practical experience on the plains was in a period characterized by a succession of dry seasons. In Utah it is quite clear that practically the warmer seasons have become far more profuse in rainfall than they were fifteen years ago; and at the eastern foot of the mountains, the settled localities, as Denver, and the districts both south and north of the original center of settlements, afford marked evidence of improvement. But there are no statistics of measurement which afford any positive evidence; the periods observed at the military posts being quite irregular, and not sufficiently extended to establish any law of increase.

On no point of practical results are both writers and observers more thoroughly agreed, than in affirming the value of forests, as agents of at least local amelioration of climate. An essential condition of the growth or improvement of a soil by chemical decomposition of its elements and by the deposit in or on it of vegetable mold, is the constant permeation of its strata by the water of rains and snows. These waters bear more or less ammonia always with them, which is the chief agent of rock decomposition, and in practical experience the forest soils of the central States are found deeply decomposed and fertilized. They are also free in absorbing water, holding it long, and yielding it slowly by subsequent evaporation and by drainage through the surface strata in permanent springs. The first result of too great and general clearings of the forest is to dry up the springs, and next to harden the surface soil, forming a stiff mass which sheds the water of ordinary rains, and can only be permeated by water and by the roots of plants when thoroughly broken up and fertilized by artificial means. After long periods of exposure the surface becomes so hard and refractory as to bear little or no resemblance to the soft, moist, deep soil of the original woodland. The denudation of the hills and upland plains of any one of the central States will show a marked decline in productive capacity, from that belonging to the original or first occupancy. At that time the wealth of the soil had not been wasted, nor had the general exposure of the surface deprived the crops of the shelter of adjacent woods, preventing the dry and caustic winds from exhausting the vitality of every plant exposed to them.

The ordinary condition of the atmosphere, as it sweeps in general progress eastward, is that of an absorbent of moisture. When rain is not actually falling, the air is taking up moisture, and if nothing is offered to it by ordinary evaporation from the surface, the condition soon becomes arid, or deficient in the quantity necessary for favorable action on vegetable growths. Though a desert surface intensifies the aridity, yet an ordinarily dry and denuded surface yielding no moisture by evaporation soon renders the surface atmosphere unduly dry and caustic. The Summer winds may even approach a sirocco in quality, and those of Winter are piercing and destructive. The water surface of any one of the great lakes is quite sufficient to neutralize either extreme for the countries lying on the line of atmospheric circulation across these lakes; and while the actual rainfall of Buffalo, Niagara, and Lockport is but small, the air is rarely or never biting in its aridity, as when it reaches the eastern and cultivated border of the plains after traversing hundreds of miles of surface destitute of water, forests, or other moisture-yielding conditions.

The practical question is, whether, with a general climate of constant rainfall, the smaller quantity of such rainfall can be diffused and distributed so as to sustain the constant vegetation of the central and eastern States. What may be accomplished by replacing that which we are accustomed to regard as the natural covering of the soil in the forests? And what further by cultivation, by special irrigation, and by shelter from the present unrestricted sweep of surface winds? In answer, it may at least be assumed that important ameliorations of the local and surface conditions are certainly within control. And the whole field of action is in a climate especially mild as compared with the north of Europe. The denuded uplands of Germany, the exposed mountain districts of Scotland, and other localities of the Eastern Continent where cultivation struggles to reclaim every inch of surface that may be made to yield the smallest product for human support, present examples of deterioration. The entire area of the plains, and all the plateaus, mesas, and basins of the interior need nothing but water to make them productive in valuable staples. Everywhere within the United States it is warm enough, and the natural soil is rich enough. So great is this natural capacity, that every observer and writer who has visited these districts believes that irrigation would be profitable in every case where it would be possible; the general presumption being that many of the valleys and river bottoms near the mountains will continue to be deficient in rain, and can only be cultivated by the aid of irrigation. The concentration of settlements in the basin districts of Utah and Idaho has fortunately tested this capacity for profitable cultivation by irrigation very thoroughly, and it is pronounced successful in all cases. The mountain streams are abundant and permanent, showing a profusion of Summer as well as Winter rains on their summits. The rain which would be sufficient, probably, if equally distributed over valleys as well as mountains, is condensed by attraction on the higher ranges, and therefore is not constant in the valleys. In short, it is not the general average supply that is so much at fault as the local distribution.

But the districts on the eastern slope of the greater mountain plateaus are probably the most difficult to deal with. The great ranges have exhausted most of the moisture of the aerial volumes from which the Summer rains fall, and until their disturbing influence has been wholly exhausted the deficiency of rain continues. Probably a belt at Denver and near the eastern foot of the mountains has the quite insufficient quantity of fifteen inches of rain annually, and another, stretching two hundred to three hundred miles eastward, has but twenty to twenty-four inches. This is not of itself decidedly adverse, and cultivation might here succeed without irrigation, if adequate shelter and local ameliorations could be introduced. Possibly a portion of the drier belt could be so cultivated ultimately; but, for the present, irrigation would be necessary to break up, permeate, and prepare the soil.

The proportion of the rainfall absorbed by the soil, or otherwise retained temporarily on the surface, must vary so greatly with different soils and exposures as to render calculation difficult. It is said that a share of the surface of the plains near the sources of the several forks of the Kansas River is somewhat loose in texture, readily taking in a large proportion of the rainfall, which subsequently rises in and near the bed of the several streams. In most of these river beds water is readily found a few feet from the surface, even when none is visible without digging. Generally, however, the surface is hard and repellant, throwing off nine tenths, at least, of all the water falling in rain and snow. The proportion retained or absorbed should be not less than one fourth; and certainly in the original woodlands of the central States much more than this proportion was the permanent stock of the loose, leaf-mulched surface, the ponds and the saturated strata of soil through which the water slowly made its way to the living springs.

As an illustration of the value of the several natural agencies for diffusion of moisture, the condition of the country bordering on Lake Ontario may be contrasted with that of Eastern Virginia and Maryland. The actual injury occurring from periods of extreme dry weather is less in New York and Canada, near this lake, and with less than thirty inches of annual rainfall, than in Virginia and Maryland with forty-four inches. The large forest and water surface lying west of Lake Ontario softens the surface atmosphere and increases the rainfall to some extent, while accomplishing far more of benefits through general diffusion and utilization of the quantity of water that does fall. It is possible that the great lakes themselves have been the chief agents in creating and preserving the forests of all the States near their latitude, and that in their absence the open plains and denuded surface would have stretched far toward the Atlantic coast.

In regard to the distinctive question of forest planting, perhaps the most important statement that may be made is, that it can never be unprofitable, whether general consequences of value are derived from it or not. For proprietors or occupants of the soil in any degree, from the owner of a single quarter section to the most extensive proprietorship, the most remunerative return for labor or investment would be to clothe a share of the surface with a growth of timber. Railroad companies may in this way protect their lines of track from drifting snows, and at the same time secure large advances in the value of their lands along any great thoroughfare. At either the eastern or western border of the plains proper facilities already exist to prepare and plant at little absolute cost, and the subsequent protection from fires and other casualties can be secured through systematic breaking up of the original surface. Experience has everywhere shown that the growth of both deciduous trees and evergreens is very rapid on the soil of the prairies and plains. Five or six years from the planting would give a surplus in thinning sufficient to pay the cost of removal, and eight or ten years would give fencing material and firewood in abundance. The locust, osage orange, and ailanthus are perhaps the strongest and most rapid growers; they are very hardy, and would test the question of growth and protection to the surface very promptly. On the northern and cooler districts evergreens might be more efficient, especially in forming protection-belts against the winds. While on the prairies almost anything will grow, practical experience is wanting as to the question what varieties of timber are most available; there is nothing in the known conditions of climate or soil in the general surface adverse to the reasonable expectation of success. Localities will probably be found on which no efforts would be successful, but of the general capacity of the climate of the plains to sustain forests there can be no doubt. And this is also as decidedly true of deciduous trees of the ordinary class belonging to the older forests of the east, as it is of evergreens, cottonwoods, and poplars. On the northward slope of the drainage toward Hudson's Bay, in Dakota and Minnesota, the river borders in localities protected against fire often show fine clumps of elms, maples, and oaks, not less luxuriant than those of Michigan or Ohio. On the more distant plains of the Athabasca and its sources, even more abundant natural forests of maples, oaks, and other deciduous trees are found, the single condition necessary to their existence appearing to be protection against fire and casual destruction.

At Fort Kearney, on the Platte, with a rainfall of twenty-five inches, there cannot be greater intrinsic difficulty in planting forests than on the Moose or Pembina Rivers, at the forty-ninth parallel, and on the same meridian. A narrow belt east of the Black Hills and west of the Missouri, embracing the "Bad Lands" and the Missouri Valley for some distance above Fort Sully, appears to be more decidedly deficient in rain at the critical seasons than any part of the country surrounding it on either side, possibly due to the exhaustion of the surplus moisture in the season of showers by the elevated mountain summit of the Black Hills, the Big Horn, and Wind River Mountains. Two years of observation at Fort Pierre, eighteen hundred and fifty-five to eighteen hundred and fifty-seven, would appear to support this view, as also do the general and local descriptions of the country by travelers and residents. Observations at Fort Sully, however, which is very near Fort Pierre, both being on the Missouri near the forty-fourth parallel and the one hundredth meridian, show for eighteen hundred and seventy-two an abundant Summer rainfall; while in eighteen hundred and fifty-six there were but three and one half inches, in eighteen hundred and seventy-two the quantity was ten inches. The range between the quantities in extreme years is at this point undoubtedly great, and the adverse influence on general cultivation may be considerable.

But none of this difficulty exists after passing a short distance westward at the same latitude. The bottoms of the Little Missouri River abound in timber and grass, and all the country west of the one hundred and third meridian appears to have a favorable climate, the Powder River and Yellowstone districts particularly. In the more decided valleys of Montana, near the Rocky Mountains, local deficiencies exist, and irrigation is necessary. Facilities exist for such irrigation, however, in abundant mountain streams and easy diversion of their waters, but far the greater body of open country north of latitude forty-four degrees appears to need no irrigation. At Fort Randall, on the Missouri, at forty-three degrees north latitude, and not far below Forts Sully and Pierre, before referred to, there is a reasonable abundance of rain from May to September; and on all the coteaux, or higher prairies of Eastern Dakota and Western Minnesota, there is no material deficiency. The same conditions are known to apply to the Red and Pembina River districts, and to the country on the Assiniboine and the Saskatchawan, chiefly beyond our boundary. As far as surveyed, the Upper Yellowstone district is found to be profusely watered, though the vicinity of the new park is too greatly elevated to be free from Summer frosts.

Descending toward the Missouri the climate is greatly softened, however, and it is especially mild about Fort Benton, where, also, though but two thousand six hundred feet above the sea, the Spring and Summer rains are reasonably abundant.

On all the plains proper—and the greater prairies of the western parts of Kansas and Minnesota should be classed as plains—the special deficiency of timber is such that every inducement exists to cultivate forests as a source of profit. The sweep of the fires by which the native forest has been kept down needs only to be averted to favor the most liberal growth of either deciduous or evergreen trees. The value of the protection tree plantations give can at once be realized, and while co-operation and legislative aid are desirable in the highest degree, there is still a certain reward within reach of every single and isolated planter. Protection against the sweep of surface winds, especially in Winter and Spring, is a great need of the prairies, even in Illinois; and a practical comparison of their productiveness when partially sheltered, as is so common through the natural oak openings of Wisconsin, shows a great preference over the entirely naked rolling prairie. Lands so sheltered can be more profitably cropped than the unsheltered rolling prairies, especially in wheat. The requisite detail as to modes of planting, and to classes and varieties of timber trees, has been clearly explained in several publications by practical cultivators. The Commissioners appointed under an Act to promote the growth of forest trees of the State of Wisconsin have, in their reports, thoroughly treated the practical questions of actual planting. Many other official reports and private publications have urged the same general policy, and have explained the conditions of its operation for different localities. All these writers ascribe important modifications of the local climate to the influence of belts or bodies of woodland, and in no case have results been reported adverse to the hope of such benefits.

Under these circumstances, the time is particularly favorable for legislative action, inciting or positively requiring tree planting as a condition of the original disposal of the public lands. Public opinion is so favorable on the point of anticipation of personal profits to every planter that no burden would be imposed by such legislation which would not be returned to every land holder directly; the general benefit resulting would be additional to the personal benefit. No more favorable circumstances for initiating measures on the part of the General Government could be expected in any case.

In common cultivation, extraordinarily favorable effects are produced by the simple process of mulching; covering the surface with some light, loose mass, composed of vegetable matter undergoing slow decomposition, if possible, but nearly the same benefits are realized by covering the surface with material affording protection simply. Soils that would otherwise harden to absolute imperviousness, and destroy the local vegetation in consequence, are by mulching kept uniformly moist through long periods of absence of rain. The same principles apply to a forest-covered surface; loose deposits of leaves usually practically mulch the actual surface, retaining moisture for a long time after its absolute loss on open plains; and, in addition, the entire depth of the forest is in a moistened and moderated condition, holding more or less of the products of constant evaporation, and tempering the winds which sweep over it by absorption of heat and diffusion of humidity. The agency of forests in such surface modification cannot fail to be great in the moderate climate of the latitudes of the plains. At higher temperatures, and with an intrinsically barren surface, the resulting influence might not be perceptible, but cool as the Summers are at any point from the thirty-eighth to the forty-ninth parallel, the surface winds need only slight accessions of humidity to rob them of special aridity.

PROPORTION OF RAINFALL THROWN OFF IN SURFACE DRAINAGE.

The actual proportion of the rain falling on any district, thrown off in the ordinary surface drainage, has been calculated with care in many cases as a basis for the construction of works for the supply of water to cities. The results are variously stated at from fifty to seventy-five per cent of the annual fall, in average districts of the Atlantic States. Ellet calculated the discharge of a stream called Anthony's Creek, a tributary of the Greenbrier River of Virginia, by daily measurements for one year, to be seventy per cent of the quantity falling in that year, and sixty-five per cent of the average fall for a period of years. In all these localities of the Eastern States, a fair proportion of woodland, and also of loose soil and cultivated surface, would be included, thus affording conditions much more favorable to the retention of moisture, and its absorption into the soil, than those existing on the general surface of the plains. If the rainfall of Maryland, at forty-four inches, should average to throw off sixty per cent as a basis of available drainage for water supply to reservoirs, there would be twenty-six and one half inches of waste, or of ordinary flow into rivers, and seventeen and one half inches permanently diverted by absorption and evaporation. And of the quantity thus retained and resupplied to the air, some portion would inevitably be redeposited in rain; and thus the primary rainfall, as it may be called, may at the season of showers receive considerable augmentation. And this increase once established, it becomes permanent so long as the surface continues favorable, increasing the humidity of the local atmosphere and the cultivable capacity of the soil.

Applying this analogy to the plains, a quantity of twenty inches now found falling on the dry surface, and of which seventy to ninety per cent is immediately thrown off in the streams and rivers, may, by covering the surface with forests in part, and by breaking up the hardened turf in cultivation, diminish the waste from eighty to sixty, or even fifty per cent; retaining, say, six or eight inches of this quantity in some form, and at least preventing the immediate waste from which no secondary benefits can now be derived. The practical value of the primary water deposit cannot fail, under such change of surface, to be equivalent to an addition of ten per cent to such original quantity; sufficient in many cases to secure important results, and to obviate deficiencies that are now decisively adverse to whole classes of crops. A further measure may be suggested here, in the construction of what may be called temporary reservoirs, in which the surplus of the profuse showers falling in Spring and early Summer may be retained to be distributed by channels of irrigation, or to secure general benefits by simple retention. The cost of such works need not be great, nor need they be more than such temporary obstruction of the smaller drainage channels as is within the power of a few settlers at any locality to construct at any time. For these, as for all preliminary works of the kind, the agency and means of the railroad companies may be easily and effectively employed. Whatever may be found practicable in this respect, it is clear, that eight to ten inches of rainfall in the three or four months of most rapid growth, can be utilized to a much greater extent than to permit eighty per cent of the quantity to run off at the moment it falls, affording no useful result, and only flooding the valleys of the Kansas and its tributaries at a time when no surplus is wanted in these valleys. Travelers and surveying parties have frequently found these rivers flooded in May and June from the rainfall of the plains alone, and not from the melting of mountain snows. The Platte has generally a rise in June, due to its mountain supplies, but the Kansas does not receive any drainage from the mountains proper; the upper tributaries of the Arkansas and the Platte cutting off the entire mountain drainage, and covering all the district at the immediate eastern base.

There is every encouragement, indeed, to efforts directed toward the utilization and retention of the actual rainfall of the central portion of the plains, that portion near and between the existing Pacific Railroad lines. And the modes suggested are chiefly such as are intrinsically calculated to repay any expenditure, personal or general, whether expected general consequences shall be realized or not. Timber cultivation is in itself profitable, and its success certain, so far as any requirements of soil and climate are concerned. It may, therefore, be undertaken by the isolated settler, by the colony where association is most readily accomplished, by the railroad for the protection of its own line and the improvement of its own lands, and by the States and the General Government, as a condition of the original conveyance of title. In either and all these cases, the sufficient remuneration for any expenditure can scarcely fail, and the general result will exhibit benefits proportioned to the extent of the coöperation by which any work may be undertaken.

To an agriculturist, the theory and the practical results of mulching are so constantly recalled in this connection that we cannot forbear a further reference to this point. On soils unbroken and hard in surface even the abundance of eastern summer rains is almost wholly thrown off, and they suffer from drought in a climate with an average annual fall of four inches per month. But the same surface, if covered with loose materials, if in forest, or if under deep and thorough culture, scarcely suffers at all in the most extreme seasons. The moisture is simply retained and utilized, perhaps forty or fifty per cent only being thrown off, as against eighty per cent for the naked and unbroken field. And the specifically mulched surface retains abundant moisture always, the surplus penetrating deeply, when it falls, and capillary attraction slowly but steadily bringing it to the surface, so protected, for months afterward. Equally striking is the retention of moisture in the woodlands. Every condition requisite to the penetration of the earth by the falling rain, and to its subsequent return to the surface as wanted, is more decisively afforded by the dense forest than by the most skillful mulching in cultivation.

The permanence of woodland springs, and the slow but steady flow of forest streams, are familiar facts; and the change which absolute removal of the forest makes on any surface of the central States is very striking. Denudation of the uplands of central New York or New England has already worked serious evils, greatly reducing the fertility of exposed lands. Similar results have been felt in Germany, and efforts to restore forests to these denuded tracts are found to encounter almost insuperable difficulties. The increased severity of the winds, and the caustic and absorbent character of these winds at very low or high temperatures, often destroys an incipient growth of forest trees, which would have been safe if protected. Some such difficulties may very likely be encountered in planting on the plains, but that they are not insuperable may be inferred from the fact that in Germany, as in New England, something of the same difficulty exists in restoring forests to tracts known to have been originally clothed with a heavy growth of trees. The growth of forests, in nature, is the slow work of centuries, and special causes of injury, resulting from man's agency, steadily invade and diminish these primeval growths. The most constant danger on this continent is from fires, and the savage tribes are as destructive in this respect as the civilized races, who have some care to restore what is by accident or intention destroyed. In the Eastern and central States of the Union, the great obstacle to easy settlement was a heavy forest, but at the border of the plains the new necessity is to build up what our habit has been to wastefully cut away. But the power of associated effort, of legislation, and of public opinion, is fully equal to the emergency. There is no natural obstacle so great as to be insuperable, and particularly in the climate we find more to favor than was expected. In the soil there is also the most decisive evidence of adaption to forest growths, if we can only secure the presence of a fair proportion of moisture.

It can scarcely be doubted that forests are the order of nature for the amelioration of both soils and climates in the temperate latitudes. They distribute and retain the water which, though it may fall in sufficient profusion, is wasted in the sudden flow from a dry and bare surface. They secure also such permeation of the surface as is essential to the decomposition of its elements, and to the formation of the soluble products required in the nutrition of both plants and animals. Forest soils are always rich; in those of the central and most of the Eastern States nothing could exceed the diversity of adaptation to valuable products in cultivation. Inequality of elements and irregularity of productiveness are the usual characteristics of the soils of open plains; and a belt of heavy timber of deciduous trees, even if lying beside the richest western prairie, is found by the settler to exceed the prairie in productive capacity. This is a direct consequence of the diffusive and permeating power of the trees themselves; not a condition created by original advantages. Such heavy timber soils will produce one half more of corn or wheat, in most cases, than the prairie soil lying immediately beside them. On the thin and sandy soils of the Atlantic seaboard, the pine or other evergreen alone will grow; the intrinsic deficiency of mineral elements being beyond all power of correction. But even here the surface soils were for a time highly productive, when the primeval growth of pines was first cut away; and now the only renovation possible, without undue expense, is through a renewed growth of pines. No spot of the plains so far identified has soils intrinsically as thin, inferior, and deficient as many of those that lie near the Atlantic coast from New Jersey to Georgia.

EUCALYPTUS GLOBULUS,

ITS USE IN IMPROVING THE SALUBRITY OF MARSHY AND MALARIAL DISTRICTS.

The many very interesting accounts which have been published with regard to the *Eucalyptus globulus*, do not seem to have exposed all of its values. And we find, in *Comptes Rendus* of October sixth, a note presented to the French Academy of Sciences by M. Gimbert, in which he describes another value equally as great as those with which all are so familiar. From reports received from various reliable sources, it seems to have been determined that in localities where the *Eucalyptus* flourishes there has been a complete disappearance of intermittent fevers. "A tree," says the author, "springing up with incredible rapidity, capable of absorbing from the soil ten times its weight of water in twenty-four hours, and giving to the atmosphere antiseptic camphorated emanations, should play a very important part in improving the health of malarious districts." It has the property of absorbing directly and rapidly the water of shallow marshes, thus preventing the fermentations which are produced, and paralyzing the animal miasma proceeding from them which might arise from them. The predictions with this regard, which were made in eighteen hundred and sixty-nine, have in all cases been realized. The author furnishes a few of the numerous results, which are very interesting.

The English were the first to experiment in their sanitary plantations in Cape Colony, where they were eminently successful. Two or three years were found sufficient to change the climatic conditions, and the aspect of the malarious district of their possessions.

Some years ago, the Algerians took occasion to spread the *Eucalyptus* throughout the French possessions in Africa, and the following are some of the results obtained, as communicated by M. Trottier:

"About twenty miles from Alger, at Pondouk," he says, "I owned a property situated near the River Hamyze, the emanations from which produced intermittent fever among the farmers and their servants every year. In the Spring of eighteen hundred and sixty-seven I planted upon this farm thirteen thousand plants of the *Eucalyptus globulus*. In July of that year, the season in which the fevers appear, the farmers were completely free from them. In the meantime the trees had scarcely attained a height of more than eight or ten feet. Since that time the settled population has been entirely free from fevers."

Fourteen thousand *Eucalyptus* trees were planted upon the farm of Ben Machydlin, in the vicinity of Constantine. It has for several years past been noted for its insalubrity, being surrounded with marshes throughout the entire year. The trouble entirely disappeared and the soil became perfectly dry in five years. The atmosphere is constantly charged with aromatic vapors, the farmers are no longer troubled with disease, and their children are bright with health and vigor.

The operations of the manufactory of Gué in Constantine were rendered wholly impracticable during the Summer, on account of the pestilential emanations from the marshes with which it was surrounded. M. Saulier conceived and put into practice the idea of planting a large number of *Eucalyptus* trees in these marshes, and in three years about twelve and a half acres of the marshy soil were converted into a magnificent park. The water completely disappeared, and the health of the workmen has since been in good condition.

In consequence of the large grove of *Eucalyptus globulus* on the farm of Maison-Carrée, which is situated in a district in which the inhabitants formerly succumbed to the malaria, similar hygienic revolutions have taken place.

It is stated by land owners in Cuba that there also the paludal and telluric diseases have disappeared from the malarial districts where the *Eucalyptus* has been cultivated.

According to Ramel, Australia is very healthy where the *Eucalyptus* flourishes, and unhealthy where the tree is not found.

On the banks of the Var, near the entrance of a railroad bridge, is situated a garrison house, near which earthworks were thrown up to dam the river in order to build the bridge. The malaria arising from it made it necessary to change the guard each year. Two years ago, M. Villard, the engineer in charge of that section of the road, planted forty trees in the vicinity of the building, and since that time this post has been the most healthy in the country.

These evidences fully establish the fact, that the *Eucalyptus globulus* has a good effect in preventing the spread of malarial diseases, and that it may serve decidedly practical purposes in this particular. Throughout our entire South and Southwest, many valuable enterprises have been wholly impracticable from causes stated above, and if the examples thus set before us were followed throughout the South, there is no doubt that many of the dismal, swampy, and marshy districts, hitherto entirely worthless, may be transformed into beautiful, pleasant, and healthy sections.

[From the Alameda Encinal.]

THE EUCALYPTUS FOREST.

While on our last weekly tour after items, we visited the farm of our pioneer forest planter on this coast, Mr. James T. Stratton, about two miles northeast of this town, and were surprised at the astonishing growth the trees on his *Eucalyptus* plantation have made during the past year. We have referred briefly to this enterprise several times, but as forest planting is largely engaging the attention of our farmers at the present time, and, indeed, of all who feel interested in the future welfare of our State, we think a more extended description of it would be interesting to our readers.

Until the practicability of forest culture was demonstrated by Mr. Stratton, the opinion was generally entertained that we would always be compelled to depend entirely on distant points for our supply of the hard woods. The example which has thus been set will be worth millions to our State, and already we hear of several capitalists who are contemplating a like venture on a large scale. We learned from Mr. Stratton that his attention was first directed to the subject of forest culture in eighteen hundred and sixty-nine, while observing the wonderful growth of the *Eucalyptus* or Australian gum tree at his residence in Oakland, and having, in April of that year, secured all the seed he could obtain from them, he immediately planted them in a nursery, and succeeded in raising about forty thousand young trees, about thirty thousand of which he planted, in November and December of that year, in a permanent plantation, eight feet apart each way, covering about fifty-four acres. These were all of the variety *Eucalyptus globulus*, or blue gum of Tasmania, and are now generally thirty-five to forty feet high, and from five to nine inches in diameter two feet from the ground.

In the Spring of eighteen hundred and seventy-one he planted about fifty thousand more blue gum, covering about sixty acres, choosing for this planting a high hill, the soil of which is quite sandy, and is classed by farmers among the poorest soils in this vicinity. Every one predicted a complete failure in this field, and old practical farmers were inclined to question the judgment of their new competitor for agricultural honors; but the result shows that he acted wisely, as the trees are perfectly at home, and are making a growth nearly equal to that of the first planting, which was on rich valley land. A month ago these trees were from twelve to twenty-five feet high, and two to four inches in diameter, but the proprietor has recently had them cut back from four to ten feet, to prevent them from becoming topheavy, and hence liable to be blown down when the ground becomes soft during our long rains. In the Spring of eighteen hundred and seventy-two he added to the hill plantation about twenty thousand more trees of various varieties—blue gum, red gum, iron bark, stringy bark, etc.—all of which are doing well, and looking as healthy as if they were growing on their native Australian hills.

Mr. Stratton intends to add to his plantation about thirty thousand trees of different varieties of *Eucalyptus*, in March and April of the present year. This will make a total of one hundred and thirty-five thousand trees, covering about one hundred and seventy acres, and will, we believe, be the largest artificial forest on this continent. He commenced the enterprise with the sole view of growing the forest for fuel alone, which in a few years will become scarce in this country, and of course valuable, believing, in common with others, that wood of such rapid growth would be too soft to be of any value for mechanical uses; but experiments that he has recently made to test its value for timber, satisfies him that it will successfully compete with any of the imported hard woods, hickory alone excepted. An inch square stick of blue gum, taken from the sap, suspended horizontally on supports two feet and six inches apart, sustained on a centre point two hundred and sixty pounds without breaking, being bent by that weight only one inch, showing a strength equal to the average of imported ash. Its specific gravity is six hundred and eighty, that of Eastern ash and maple being about seven hundred and fifty. It is not, however, durable under ground, as a plank three feet long, two inches thick and fifteen inches wide, including the heart as well as the sap of a tree ten years old, planted two feet deep, completely decayed in one year beneath the surface, while the part above ground remained perfectly sound.

The other varieties of the *Eucalypti* are generally of comparatively slow growth, but the timber is stronger, heavier, and more durable, and Mr. S. thinks that within twenty years we will be able to supply, from our *Eucalyptus* forests, all the demand on this coast for the hard woods.

Since the enterprise was started, the medicinal value of the tree has been discovered, and the hospital experiments that have been made by Dr. J. S. Coleman, in San Francisco, indicate that the extract of its medicinal properties is doubtless destined to become a valuable substitute for quinine as an anti-periodic tonic and febrifuge, and that it is an invaluable remedy in diseases of the kidneys, bladder, etc. So abundant is the active medicinal principle in the leaves of this tree, as determined by Dr. Coleman's experiments, that should quinine be entirely supplanted by the new remedy, Mr. Stratton estimates that his *Eucalyptus* forest alone could supply the demand for the whole United States.

As we stated, the trees of the first planting are eight feet apart, those subsequently planted being six by seven feet apart. It is intended to begin to cut out the poorer and scrubby trees when they are about five years old, and a second cutting about two years later, leaving about one hundred and fifty trees on an acre to remain for timber. These earlier cuttings will only be useful for fuel, but will pay all the previous cost of the enterprise.

He expects to begin cutting for timber at ten years from the seed, and thinks that he will then be able to show clear logs twelve feet long and fifteen inches in diameter, worth at least five dollars in the tree, and that in twenty years he will have trees one hundred feet high and two feet in diameter; and from our own observations on the growth of these trees in different localities, we believe his expectations will be realized. The disposition of the timber to warp and twist while seasoning will detract somewhat from its value, but this can doubtless be obviated to a great extent by seasoning it in well ventilated stacks.

The proprietor informs us that the actual cost of raising the trees from the seed, together with the necessary expenses to the present time, is about eight thousand five hundred dollars, exclusive of interest or the cost of the land, which is worth about eighty dollars per acre. Yet, notwithstanding the heavy expense attending the enterprise, it cannot fail in the end to be highly remunerative.

Mr. Stratton is one of our pioneer land surveyors, having arrived in the State early in eighteen hundred and fifty, and having resided in this county since eighteen hundred and fifty-three; and he is prominently known throughout the State, having been connected with many of the most important surveys, and he has hosts of friends who will be glad to learn that he is making a magnificent success in a hitherto unentered field on this coast—a *Eucalyptus* forest.

BEET CULTURE.

THE CULTIVATION

OF THE

BEET FOR THE MANUFACTURE OF SUGAR.

Being a translation of the agricultural part of the work of Louis Walkhoff, "The Practical Sugar Manufacturer and Refiner." (1)

HISTORICAL.

The use of sugar seems to have been known in the earliest times. The Greeks and Romans mention "a kind of honey upon the leaves of a cane" (Dioscorides, A. D. 41), the Indians "drank the sweet sap of a kind of cane," and Humboldt conjectured that the Chinese probably understood pressing sugar from the cane much earlier, for the process is represented on a very old Chinese porcelain. Physicians of Nero's and Trajan's times (Pliny, A. D. 98), described sugar as "Indian salt, in hardness and color like common salt, but tasting like honey." We find sugar at that time in various forms, liquid and solid, as medicine, and as a pleasant, invigorating article of food, and even now the negroes in America fatten upon the sap during the gathering of the cane.

Can we wonder, then, that sugar, in which nature has united the agreeable with the useful, should be in almost universal use throughout the entire world; that in many countries its manufacture has been the object of the most extensive experiments.

The advance of civilization, which accustoms man involuntarily to new necessaries of life, and sets his intelligence and invention at work to supply them, has made sugar production so universal in all countries, that the civilization of a people can be estimated to-day with as much certainty by their consumption of sugar, as by their consumption of soap.

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(1) "Der Praktische Rubenzuckerfabrikant und Raffinadeur, ein Lehr—und Hulfsbuch für Rubenzuckerfabrikanten, Betriebsdirigenten, etc., nach eigenen langjahrigen Erfahrungen bearbeitet von Louis Walkhoff, praktischem Rubenzuckerfabrikanten aus Madgeburg." Vierte neu bearbeitete und vermehrte Auflage.—Braunschweig, Friedrich Vieweg & Sohn, 1871.

Sugar was introduced into Europe by means of the Crusades, thus the destroying sword has been made to serve, in a remarkable ner, in laying the foundation of a flourishing branch of industry most peaceful kind. Venice, whose fleets crossed the seas and effe the interchange of commodities, received the first sugar in the eleve century; and again, it was a Venetian who originated the art of refi sugar, bringing it to a more perfect form.

In the year eleven hundred and forty-eight, sugar-cane was plante Cyprus and Sicily, from whence it spread over the Andalusian co then to Madeira, and, in fi.teen hundred and six, was planted in West Indies. As early as fifteen hundred and ninety-seven, there a sugar refinery in Dresden, and in the beginning of the sixtee century, sugar refining, by the application of lime water and the w of egg, was described by Angelus Sala in his Saccharologie. (Knap From the same early time date the first written treatises on the ma facture of sugar, and it may well be believed that a certain techn skill in refining existed at the same time, for the name candy (as well the preparation of it) was mentioned as early as fifteen hundred ninety-five, in the Alchimia of Libavius. (Knapp.)

The sugar we have been considering was obtained only from the co mon Indian sugar-cane and its different varieties, and the eminent G man chemist, Marggraf, first, in the year seventeen hundred forty-seven, published his researches regarding the existence of sug in various roots, especially in the beet.

The art of making sugar from the beet, which we propose to consid exclusively in the following pages, is, therefore, the child of the c north, and, in fact, of German research. It is not the resuit of bl chance, and does not depend upon simple processes, like the discove and the extraction of sugar from the cane, whose sap, in the want ness of tropical climes, is presented to the indolent population of th regions as an almost pure sugar solution. No; the production of su from the beet is the tedious but steadily developing result of earn study, of stern diligence, and of northern thought; the power of mi counterbalancing the inclemency of climate.

This discovery was, however, not made at once; but the honor is d to Maggraf's able pupil, Franz Carl Achard, of having first expe mented upon the possibility of a profitable production of sugar fro crop easily grown in all European climates. The experimental facto built with royal aid in the year seventeen hundred and ninety-six, the Cunern estate, in Lower Silesia, near Steinau-on the-Oder, had s a good result, for those times, that the Baron von Koppy built a seco factory at Krain, near Strehlen, and Nathusius a third in Althald sleben. In Bohemia, sugar factories were begun as early as eig teen hundred and two. In a work entitled "The European Beet-r Sugar Manufacture," seventeen hundred and ninety-nine and eight hundred and twelve, we find a careful description of the manufacture that time, treated with such copiousness and clearness, especially garding the culture, soil, manure, and choice of the species of beet for purpose, as cause us to confess with shame that, as followers of Acha we have not made the progress in these branches which was possible the present advanced state of natural science—beet-root sugar maki being even now in its infancy, and far from having attained that p fection of which it is capable. But, if we have to honor the Ger scholar who was capable of writing such a work at that time, we m still more esteem the German nobleman who, as Prince Louis Napole tes in his Memoirs (page 171), declined the offer of fifty thousand lers made him, anonymously, from England, in order to stifle the t sugar manufacture in its infancy, as it were, through its author. e same illustrious writer (the former Emperor of the French) relates ther, that, in the year eighteen hundred and two, Achard, the founder of et-root sugar making, was offered two hundred thousand thalers if he uld publish a work, in which he should state that his enthusiasm had rried him too far, and that trials on a large scale had clearly shown e experiments with small quantities to be of no value. Achard simply clined these offers, not even mentioning them once in his writings. ildren of Germany, read and be astonished! The heart swells with ide to find in the founder of the beet sugar industry a man of so much rning, spirit, and honor—no longer belonging to Germany, but to all rope.

The reader will pardon me for tarrying so long with so noble an ample; but these traits of character, which in foreign tongues and rks, I have found held up for the admiration of the whole world, rely deserve to be recorded in all histories of German industry.

Let us now turn to the extension of the beet-sugar industry, whose rliest infant development caused so much apprehension to the possessrs. of tropical colonies. Growing fast, like a thriving child, it soon read over France, Germany, and Russia. The English understood rfectly the German temperament, and knew what was to be expected om German pertinacity, and dispositions allied to their own. After e defeat of the above mentioned plan they resorted to other means, d induced Sir Humphrey Davy (1) to write a manual (Traité de imie Agricole), in which he stated that beet-root sugar was bitter. his learned manual, however, was of no avail; the inhabitants of Gerny, France, and Russia enjoyed beet sugar in spite of the bitterness cribed to it. During the infamous blockade ordered by Napoleon, no gar from the tropics could be brought to the countries of northern urope. It thus became necessary for the north to produce what the uth had formerly supplied, and the aid which her sovereigns bestowed on the beet sugar manufacture was indeed magnificent. There were, cordingly, in France, on the twenty-fifth of March, eighteen hundred d eleven, thirty-two thousand hectares of land, by imperial decree, voted to the culture of the beet, and one million francs appropriated its encouragement, (2) while the King of Prussia, as has been already entioned, aided the founder of this industry with large presents. In ussia, moreover, Major General Blankennagel had already established factory at the village of Akabef, in the province of Thula, and not only ceived from the Imperial Government a subsidy of fifty thousand paper ubles, but there was also a ukase promulgated by which land was omised free of cost to whomsoever would erect beet-sugar factories.

Although Germany is the real cradle of the beet sugar manufacture, d the first factories were established in that country, one at Augsrg having put twenty thousand pounds of sugar in market in eighteen ndred and ten, and another under systematic management having en established under Lampadius at Battendorf, in Saxony, in the same ar, yet this branch of industry seems to have been allowed to droop, d to France belongs the honor of having adopted the neglected orphan d reared it with the most brilliant results. Under the protection of

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1) Louis Napoleon, page 171.
2) Louis Napoleon, page 170.

the imperial eagle, the devolopment of this industry made its first vigorous beginning, and we may well be tempted to call Napoleon I the second father of the beet-sugar manufacture, and to consecrate these peaceful laurels to his memory. Encouragements of every sort enlivened the active inquiring spirit of the French people; thus, for instance, on the second of January, eighteen hundred and twelve, M. Benjamin Delessert received the cross of the legion of honor in acknowledgment of his success in the beet-sugar manufacture, and the offer of prizes as well as favors of every kind spurred on this industry in its competition with others.

On the third of April, eighteen hundred and eleven, Descostils published in France his work upon refining with lime and the treatment with spirit—the latter, therefore, it may be remarked, appears to be tolerably old. Derosne also recommended caustic lime and alum for defecation, as well as the purification of sugar with spirit. Hermbstädt discarded alum and regarded the use of lime as the only true foundation of the extraction of sugar from the beet. Several works on sugar-making appeared in France about this time, in particular those of Payen, Chaptal, Drapiez, Dubrunfaut, Bazy, Dombasle, etc, which essentially contributed to assist the rational progress of this branch of manufacture in that country, where the beet-sugar industry found its most active promoters; and although Germany, up to eighteen hundred and fifteen, as Doctor Bley, writing in eighteen hundred and thirty-six, alleges, had produced twenty-nine works on the beet-sugar manufacture, and the first factories had been established in Germany, yet in the years eighteen hundred and twelve to eighteen hundred and thirty six, the manufacture came almost exclusively under French influence. The discovery of the discoloring power of charcoal, especially of animal charcoal, and its application to the manufacture of beet sugar, produced a great improvement in the subsequent product. While formerly two per cent of sugar had often been obtained, and three per cent was considered a large result, the product now rose quickly to five and six per cent. The importance of obtaining a good beet appears to have attracted, as was natural, the earliest attention; as we see this point made prominent in all the earlier writings; later, the mechanical appliances for the reduction of the roots and the extraction of the juice were rapidly improved; finally, the chemical part appears to have reached a satisfactory degree of perfection.

The factories were built for the most part during the continental blockade; upon its discontinuance cane sugar came again into dangerous competition, the high price fell, and the manufacturers were therefore compelled to strive to increase the yield of sugar; above all, to simplify the process and to improve it, that their enterprise might not be imperiled. The elasticity of the human mind combated the difficulty of the situation and overcame it at last by assiduous observation of the phenomena, happy combination, and persevering diligence in the track of rational progress. This is the way that we must to-day contend to escape new perils. In spite of the raising of the blockade, and the great fall in the price of sugar, the new industry so sustained itself that, in France, its production rose from four million kilogr. in eighteen hundred and twenty-nine, to forty millions in eighteen hundred and thirty-five. In the years eighteen hundred and fifty-seven and eighteen hundred and fifty-eight, there were in France six hundred factories which produced forty-nine million two hundred and twenty-six thousand and ninety-one kilogr. of beet sugar.

The industry which, in the beginning of the century, put out its first delicate germ, and to which in its tender youth, as to a sickly hothouse plant, any future was part pitifully, part relentlessly, denied, had even attained its growth. It had become a tree that had already so shown its power of resisting violent storms as to authorize greater expectations. The beet sugar manufacture stands to-day strong as a German oak, which stretches its branches from southern France even to Siberia, from Italy to Sweden, and is great and powerful in conflict and in storm.

In consequence of the progress made in this industry in France, the attention of Germany was again called to it. Dr. Krause went from Austria in eighteen hundred and thirty-four, and Schubarth from Prussia in eighteen hundred and thirty-six, in order to report intelligently on the progress and condition of the manufacture in that country, and in consequence of their investigations, and probably also due partly to the well known publications of Zier and Hahnewald, many new factories again sprang into existence in Germany, and this branch of industry soon so increased in that country, in spite of many unsuccessful experiments, that it not only ceased to be subsidized, but duties and taxes were demanded from it.

In eighteen hundred and forty the tax was one fourth silver groschen per hundred weight of beets; in eighteen hundred and forty-one, one half silver groschen; in eighteen hundred and forty-four, one and one half silver groschen; in eighteen hundred and fifty, three silver groschen; in eighteen hundred and fifty-three, six silver groschen; in eighteen hundred and fifty-eight, seven and one half silver groschen; and in eighteen hundred and fifty-nine, eight silver groschen.

The amount of the tax was thus raised to the value of the raw material manufactured, and this high taxation compelled the exertion of every energy. Great as has been the progress of the beet-sugar manufacture in the last decade, it has not by a great deal attained perfection. When we consider the percentage of sugar really obtained from the beet, and the amount analysis shows to exist in it, it is evident how much yet remains to be done in order to reduce this loss to the smallest amount, to solve the problem of obtaining in practice what theory has shown as attainable.

It may not be uninteresting to compare the present extent of the beet-sugar manufacture in different countries, in order to show approximately how widely the industry is now developed and expanded. Such an exhibit is given in the following table:

	No. of factories.	Weight in centners of roots consumed.	Resulting quantity of sugar in centners.	Average to each factory.
Germany (1)	296	51,495.494⅓	4,319.640	172.619
France	434	82,850.000	5,800.000	190.915
Russia (2)	300	42,400.000	3,792.000	141.334
Austria	212	42,300.000	3,400.000	199.530
Belgium	108	14,200.000	1,000.000	131.482
Holland	18	2,143.000	150.000	119.060
Sweden (3)	4	470.000	61.600	192.500
	1,370	236,158.494⅓	18,523.240	172.380

(1) According to the statement of Dr. F. Riedel.
(2) Including Russian Poland, from inquiries of my own.
(3) From the latest private communications from parties interested.

These historical accounts, which must always be of value to the man of culture, may, at the same time, serve to arouse the zealous emulation of all who are engaged in the beet-sugar manufacture. While we look back over the road that is already passed, there seems to us to be but little yet to be traversed. The increase of production in each establishment has hitherto tended essentially to increase its profits, and we can assume the average consumption of roots by the German factories at one hundred and seventy thousand centners, whereas, in eighteen hundred and forty-eight the average was only sixty-eight thousand centners. The manufacture has also evidently increased in recent years, and if in the earlier days (that is up to eighteen hundred and thirty-six), the beet sugar industry found in France its more special encouragement, Germany has since this time hastened to wipe out this disgrace by so much more zealous strife for the perfection of this offspring of German intelligence. Schatten and Schutzenbach especially, unmistakably improved the condition of the beet sugar manufacture in their time. In eighteen hundred and fifty-one the sugar manufacturers of Zollverein united in an association having, among others, the object, by means of a special trade journal, "The Journal of the Association of the Beet Sugar Industry in the Zollverein," of facilitating the general interchange of ideas, of inducing instructive communications regarding experiments and improvements in all parts of the process of manufacture from actual experience, and thereby to render every novelty and improvement quickly available to the common benefit of all the associates. No nation, no language, possesses a similar work, of such a comprehensive and exhaustive character. It proves that at this present time the German Zollverein has again taken in hand the intelligent prosecution of this industry.

This journal will remain a monument of the labors and investigations of the members of the association, the intelligence of the German fatherland, the progressive development of the beet sugar manufacture. What results this mutual labor has effected for the manufacture, may be understood from the notorious fact that our German beet sugar industry is in advance of all other countries. The product of sugar from a given quantity of raw material, is evidently highest in Germany. The machines and implements for extracting the sugar of the beet are, unquestionably, nowhere of such substantial and convenient construction, as in Germany, and, it may be added, nowhere so cheap. The beet sugar manufacture in all other countries, is in this respect far less favored than in its very cradle—Germany.

THE CULTURE OF THE BEET.

SOIL AND TILLAGE.

The soil in which plants grow, exercises an evident influence upon the product, and to such an extent in the case of many wild plants, that by them the prevailing soil-constituents of their place of growth may be ascertained with certainty, since as these plants require for the perfection of their organisms well ascertained chemical combinations, these combinations must necessarily occur in the soil in which they find their nourishment. Hence, the classification, gypsum, lime, and salt plants. This will cause no surprise when we consider that by the term soil is meant merely a combination of conditions necessary to the subsistence of plants; since the soil not only affords the material in which they extend and fasten themselves by their roots, but is at the same time their immediate source of nutriment, and must supply them all the inorganic materials or elements, which they require for their full development, such as silica, lime, potash, etc., and if the soil be deficient in a single necessary constituent, the plant will not attain its normal development. In a soil artificially deprived of all inorganic material, no plant grows to perfection. Liebig states (1) that the mere transplanting of a tree that formerly produced bitter almonds, made it bear sweet almonds, which is certainly one of the most interesting examples of the influence that certain constituents of the soil have upon the elaboration of the plant. The great influence of the soil upon the quantity as well as the quality of root crops is equally evident, and this influence is naturally always the prevailing one. It is known to every practical beet sugar manufacturer, that certain soils produce large crops of sugar beets, of good quality and easy to manufacture, while other soils yield small crops, but of equally good quality, and others again large crops of beets, but so poor that their manufacture into sugar is entirely unprofitable. From these considerations arises the important question, how shall a soil be treated to bring it into condition for growing good sugar beets? The question is easier than the answer, and if not content with the reply, that the soil must be of kindly nature, warm, lively, free from stone, and friable, such as to rank as a rich, first-class barley soil, the inquirer may examine in vain the accurate analyses made during the half century of the existence of the beet-sugar industry, to ascertain the characteristics of a good beet soil. And yet it does not seem to be altogether so difficult to solve the problem, because it would be possible to submit to a thorough examination all those lands in different countries, which preëminently possess the property of producing good sugar beets, and to compare with them those soils, which, on the other hand, produce beets that are entirely valueless. From such an extended comparison it might, perhaps, be ascertained what conditions, chemical, physical, and meteorological, are essential.

We must confess that we are not at the present time in a position to decide upon the fitness of the soil for growing beets, even from the best analysis, and that we can but in one way obtain positive knowledge of the fitness of a soil for beet culture—that is, by actual experiment. Grow the beets, and see if they are rich in sugar.

The action of the soil may depend either on its chemical combination or physical condition. The chemical condition of the soil is of great consequence, inasmuch as a great quantity of soluble salts may occur in it, which pass into the beet, and thereby render the extraction of the sugar from it difficult. It is evident that the beet takes out of the soil into its substance a larger or smaller quantity of saline matters, according as they occur in the soil in a more soluble and more or less concentrated form.

The beet appears also to take up in a peculiar manner other salts than those essential to its growth, if they are directly presented to it, as, for instance, saltpeter. In a soil rich in saltpeter the beets also contain saltpeter, whereas this constituent is entirely absent in beets produced in what may be called a good beet soil. The presence of amygdalin in the kernels of almonds presents a similar phenomenon, and this, in like manner, is to be ascribed to the accidental position of the tree. No soil, therefore, which contains saltpeter can be called a good beet soil; chlorides also have an unfavorable influence.

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(1) Chemical Papers, page 173.

Dr. Grouven gives, as the mean of eleven analyses of soils, (1) the following figures, which represent approximately the proportions of the more important elements contained in a good average arable soil. The computation gives, per one thousand parts:

Soluble mineral salts	114.88
Vegetable matter (containing 1.55 of nitrogen)	70.37
Potash	2.10
Carbonate of soda	1.39
Lime	18.06
Magnesia	3.26
Oxides of iron, and of manganese and clay	53.69
Phosphoric acid	1.66
Sulphuric acid	0.36
Chlorine	0.05
Soluble in water, Mineral substances	0.61
Soluble in water, Vegetable	0.44

The same chemist analyzed soils from nine beet-growing districts, namely: Schipzig, Salzmünde, Quitschina, Besenstedt, Schwittersdorf, Freideburgerhöhe, Galgenberg, Benkendorf, and Dölitz. Taking the mean of these nine analyses, we find the following results (in one thousand parts):

	Mean.	Highest.	Lowest.
Sand and clay	806.7	866.4	770.08
Inorganic matter	132.0	195.4	99.2
Organic matter	39.08	48.5	34.4
Composition of the inorganic matter.			
Potash	5.93	11.83	2.33
Soda	3.86	10.14	0.60
Lime	14.67	31.42	4.07
Magnesia	5.47	10.16	0.69
Oxide of iron	29.75	34.59	22.10
Oxide of manganese	0.92	1.72	0.25
Alumina	42.40	60.47	26.08
Sulphuric acid	0.63	1.54	0.29
Phosphoric acid	0.76	1.50	0.31
Silicic acid	43.87	68.75	17.49
Carbonic acid	6.72	20.59	0.10
Chlorine	0.214	0.799	0.007
Nitrogen	1.025	1.258	0.780
Soluble in cold water, Mineral salts	0.804	2.018	0.472
Soluble in cold water, Organic matter	0.371	0.976	0.168
Power of absorbing water	53.	64.02	42.07

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(1) Journal of the Beet Sugar Industry, vol. xi, p. 211.

By the examination of the highest and lowest results, we are brought to the conclusion that the soils in which beets may be grown with profit may be very variously constituted, and that the average composition of these soils is inferior to those previously given, especially in the amount of phosphoric acid.

A beet soil, from Schlanstädt, analyzed in eighteen hundred and fifty-eight, contained one hundred thousand parts:

	Surface soil.	Subsoil.
Inorganic matter, soluble in cold water	42	32
Combustible matter, soluble in cold water	26	8
	68	40
Calcareous earth	590	3,690
Phosphoric acid	67	63
Combustible (vegetable) substances	5,300	3,800
Nitrogen	99	50

I subjoin the analysis of an admittedly fertile, arable soil, which is especially adapted to beet culture, and extends over a great part of Southern Russia.

Black soil (Tschernosem): According to Demidoff, it extends over an area of sixty thousand geographical miles, with a depth of thirty to two hundred and sixty centimeters (= eleven and a half to ninety-three Vienna inches.)

Government of Tambow.
- No. I. Manured black soil, on which hemp, opium, potatoes, etc., had been grown.
- No. II. Grass land, from a depth which had not been reached by the roots.
- No. III. A manured soil, cultivated so long as known on the three course system.

Government of Orel.
- No. IV.
- No. V.
- No. VI.
- No. VII.
- No. VIII.

Soils not yet brought under cultivation from various depths, viz: No. IV. Immediately under the sod. No. V. Eighteen centimeters (= four Werschoek, or six and eight tenths Vienna inches) deeper. No. VI. Immediately above subsoil. No. VII. Unmanured, arable land. No. VIII. No particulars known.

		PETZHOLDT.			SCHMIDT.				PAYEN.
		I.	II.	III.	IV.	V.	VI.	VII.	VIII.
	Loss by evaporation at 120° C.	18.18	9.48	8.28	12.16	8.29	5.75	8.62	6.95
	Nitrogen contained in the soil after heating to 120°	0.77	0.33	0.30	0.99	0.45	0.33	0.48	0.17
	Dissolved } By muriatic acid of 100 parts of the dried earth	18.15	20.59	12.0	6.23	5.94	5.15	7.27	14.82
	Not dissolved } By muriatic acid of 100 parts of the dried earth	81.85	79.41	88.0	93.77	94.06	94.85	92.73	85.22
COMPOSITION OF THE SOIL HEATED TO 120° IN 100 PARTS. Soluble in muriatic acid.	Chlorine	00.07	0.01	0.01	....	....	....	....	....
	Sulphuric acid	0.26	0.10	0.09	....	....	....	....	....
	Phosphoric acid	0.34	0.18	0.18	0.07	....	....	0.12	....
	Lime	2.34	4.45	0.88	0.78	0.49	0.24	0.88	0.88
	Magnesia	0.82	1.37	0.58	0.52	0.23	0.18	0.56	1.05
	Oxides of iron and manganese	9.89	10.79	9.36	2.86	2.37	2.96	3.14	6.05
	Clay	1.11	1.18		1.09	2.39	1.80	1.34	5.41
	Potash	2.32	1.33	0.63	0.21	0.27	0.31	0.25	0.82
	Soda	0.87	0.98	0.43	0.08	0.11	0.12	0.10	
	Total	18.15	20.59	12.0	6.23	5.94	5.15	7.27	14.82
Insoluble in muriatic acid.	Silicic acid	70.94	72.14	78.18	....	....	....	....	....
	Oxide of iron	1.51	1.43	1.74	....	....	....	....	....
	Clay	4.72	3.96	4.99	93.77	94.06	94.85	92.73	85.22
	Lime	0.26	0.64	0.48	....	....	....	....	....
	Magnesia	0.13	....	....	....	....	....	....	....
	Potash	3.49	1.50	3.08	....	....	....	....	....
	Soda	1.44	0.77	1.58	....	....	....	....	....
	Total	81.85	79.41	88.0	93.77	94.06	94.85	92.73	85.22

The following are later analyses of "the black soil," by Dr. Schmidt, of Dorpat; 100 lbs. of air-dried earth contained:

	IN THE GOVERNMENTS OF—			
	Tula.		Saratof.	
	Trubentschino.		Blagowischtschinsk.	
	I.	II.	I.	II.
Water	6.298	6.378	2.807	2.540
Organic matter	7.536	10.542	15.176	12.592
Mineral constituents	86.166	83.080	82.017	84.868
Lime, $K\,O$	2.364	1.756	2.470	2.660
Soda, $Na\,O$	0.152	0.266	0.720	0.339
Lime, $Ca\,O$	0.866	1.052	1.608	1.407
Magnesia, $Mg\,O$	1.332	1.372	1.398	1.449
Oxide of iron, $F_2\,O_3$	3.995 }	3.880	5.514	6.586
Oxide of manganese, $Mn_2\,O_3$	0.068 }	Trace	Trace	Trace
Clay, $Al_2\,O_3$	12.320	9.904	13.154	12.846
Silicic acid, $Si\,O_2$ (with a trace of titanic acid)	25.415	18.756	33.414	31.482
Sulphuric acid, $S\,O_3$	0.044	0.059	0.106	0.089
Phosphoric acid, $P\,O_5$	0.029	0.019	0.029	0.030
Quartz sand	39.568	46.004	23.601	27.968
Iron pyrites, $Fe\,S_2$	0.013	0.012	0.012	0.012
Nitrogen (in the organic matter)	....	....	0.446	0.363
Nitrogen—in 100 parts of organic matter	....	....	2.939	2.883

All these analyses, however, lead to no definite conclusion, whether a soil is admirably adapted to beet culture, or entirely the reverse; this problem is reserved for the future. A great difficulty arises from the fact that, in all cases, a soil analysis gives only what the soil contains at the moment of examination, and not the quantity in which these constituents may be available to the plant in assimilable form during the period of growth. The important influence which a greater or less solubility of the soil elements exercises on the growth of the beet, is especially perceptible in what are called wet seasons, in which the great quantity of rain supplies more soil constituents to the plant in a soluble form, and therefore a larger quantity of salts are taken up by the beets, and their quality for sugar-making is thus materially impaired. The fact is well known, that the yield of sugar from beets grown on the same soil, in wet and dry seasons, may vary from one to one and a half per cent, and yet chemical analysis, in the two cases, shows only a slight difference in the composition of the soil. It is likewise to be considered, that a soil with a small quantity of mineral salts may yet produce beets more largely impregnated with them than a soil containing a larger quantity, if in the one, the most easily soluble alkaline salts, for instance chloride of calcium, and in the other, the less soluble alkaline earths, such as sulphate of lime (gypsum), are most abundantly present.

This very important difference, arising from the greater or less solubility of the nutritive elements contained in the soil, presents an obstacle to the just discrimination between soils in regard to their profitable adaptation to beet culture, which science, up to the present time, has not been able to remove. This much has, however, been established, that the soil must contain, in abundant quantity and in soluble form, all the mineral constituents which are found by analysis to be essential to the beet, and that the same quantity of them that is abstracted by the crop should be returned in manure.

While, however, the chemical composition of the soil exercises an influence, its physical or mechanical condition is an equally important consideration.

We distinguish in practice sandy soil, clay soil, calcareous loam, vegetable mold, etc., according as quartz sand, clay, loam, carbonate of lime, or humus, predominate.

Sandy soil contains about ninety per cent of quartz grains (according to Schultze Fleeth). Clay soil contains about sixty per cent and upward of pure clay. Loam contains less than sixty per cent of clay. Sandy loam contains less than thirty per cent of clay. Light sandy loam has less than twenty per cent of clay.

The three last, being free loams, are to be preferred for beets, on account of their openness and ease of tillage, to the heavy or tenacious clay soils, which are apt to be cloddy, and are not easily made fine; whence a bad seed furrow and deficient plant, as well as usually an inferior quality of beets, may be expected.

According to Leplay's investigations, beets taken from the soils below mentioned, on the first of October, contained in one litre of juice, the following quantities of sugar, viz:

From clay	114 grammes.
From sandy soil	114 grammes.
From calcareous loam	117 grammes.
From mixture of clay and sand	104 grammes.

These are, unfortunately, the only facts, bearing upon this subject, with which I am acquainted.

Lime occurs mixed with clay and sand in most varied proportions, as is indicated by the term clay marl, pure marl, sand marl, etc. The proportion of carbonate of lime in marl is often as high as eighty per cent, and is of especial importance in beet culture, since experience teaches that beets which are grown on lime or marl soils are of excellent quality, yielding an especially pure juice, a point which is of particular importance in sugar manufacture, since the purer the juice in its natural state, the less attention, labor, material, etc., is required in the process of defecation.

In confirmation of the fact that beets grown upon marl or lime soils, are best adapted for sugar making, I may add that the composition of the soils of the most successful sugar factories of Bohemia (1); as Czaslau, Kuttenberg, Neuhof, Phillipshof, Radbors, Ronow (in part), Schleb, Schuschitz, consist chiefly of clays, rich loam, abounding in vegetable matter, and of free loams with layers of marl.

The soil of the estate of Girna, where excellent sugar beets are grown, is principally lime (rag-stone). At Schönhof the soil contains lime and marl.

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(1) Bomischen Rubenzuckufabrication, 1858, p. 22.

The estate of Tippeln, in East Prussia, on a marl soil under similar conditions, always produces beets exceedingly rich in sugar.

At Schosnitz, near Breslau, on the property of my brother, the beets upon a soil containing lime (marl) are always very rich in sugar.

The Smealas estate, in South Russia, was famous for the production of beets, exceeding all others in their yield of sugar (the juice often showing ten degrees Beaumé and upward), provided the quality was not impaired by recent manuring. A large quantity of lime occurs in the soil in the form of marl. Leplay, also, in eighteen hundred and sixty-one, in his researches with regard to France, expressed the opinion that the beets from lime soils commonly yield a juice richer in sugar than from any other soil, and that the beets grown upon such land show no such variation in the quantity of sugar they contain, as frequently occurs upon other soils, upon which the beets, within a small distance, often vary from twenty to forty per cent in yield of sugar, as is known to every careful observer.

From all these practical experiments and observations in various countries, and extending over many years, it seems to result that lime, uniformly distributed in the soil (in the shape of marl or the like), is conducive to the production of a beet rich in sugar and easy of manufacture.

There have been many attempts to explain this fact, but without any definite conclusion. Since the presence of lime in the soil renders it warmer and more lively, some, therefore, assume that the growth of the beet is thereby accelerated, and that these beets, in consequence, contain at the time of gathering, a sweeter and purer juice than those from a soil deficient in lime; an assumption which, as we shall see further on, is supported by physiological observations. Schübler, moreover, alleges that if we wish to express in figures the capacity of different kinds of soils for retaining heat, we may call calcareous sand, 100; silicious sand, 95.6; calcareous loam, 74.5; clay, 68.4; garden mold, 64.8; vegetable mold, 49 (1), which certainly appears strongly to support this theory. Others again regard the transformation of the organic matters and the alkaline constituents, as feldspar, by means of the carbonate of lime, as the cause of the quicker growth and ripening of the beet, and so account for the greater purity of the juice; while still others assert that the carbonic acid of the lime performs an important part in the formation of the nitrogenous constituents of the beet (as well as of the sugar), or assume that the lime neutralizes, in the soil, all the acids which are detrimental to the accumulation of sugar.

Leplay goes further, and claims to have found that the quantity of lime in the immediate neighborhood of the beet, or of its small fibrous roots, showed a diminution of nine tenths as compared with the quantity contained in the soil at a greater distance, and thence draws the conclusion that the beet takes up these elements, and that a close relation exists between the quantity of lime in a soil and the accumulation of sugar in the beets grown upon it.

At all events, this relation ought to be very carefully studied, and it is very much to be regretted that we do not possess numerous comparative examinations of the yield of sugar from beets grown upon pure clays, loams, sands, and marls.

Investigations of this kind are the more worthy of attention, and more important as contributing to the explanation of these mysterious processes, since it is an undisputed fact that the abundant formation of sugar during growth, and especially during what may be called the period of ripening, depends essentially on the soil, and that the quality, moreover, of the beet, in general, varies according to the character of the soil on which it grows.

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(1) Cosmos, eleventh year, vol. 20, No. 26, p. 724.

Indeed, we often hear the idea advanced that it is possible so to alter a soil, by cultivation or otherwise, as to make it produce beets of better quality, in the same way as the natural vegetation may change its character in consequence of diminution of moisture, drainage, or heavy manuring. I would like to know, however, if this be the case, upon what principles to proceed in order to be certain to produce a beet abounding in sugar.

Unhappily, we do not yet know all those essential conditions (though we may some collateral ones) which would make it certain to attain in every case the much desired result, which we must regard as the very foundation of our beloved industry—*a beet with the greatest abundance of sugar and the least quantity of salts.* So long, however, as these conditions are not investigated and understood with perfect clearness and certainty, and in all their consequences, so long must an inquisitive, painfully groping empiricism be the lingering and uncertain conductress of the hesitating experimenter, and every establishment which, whether by chance or by prudent choice, has a good beet soil to work with, will attain an easy victory over those competitors who have to contend with an unfavorable soil, requiring large outlay for its improvement, and, therefore, much more costly than lands which already possess the desired qualities; while success in such attempts at improvement, with our present knowledge, is not even approached, still less assured, but by the utmost caution and exactness.

The testing of a soil, as regards its fitness for the production of sugar beets, remains, therefore, restricted to an uncertain, unscientific experiment of their culture, and a careful trial of the product in the process of manufacture.

We know, indeed, that the mechanical working and loosening of the soil, and, which is of special importance, the porosity of the subsoil, the capacity of the soil for absorbing heat, the degree of moisture, the climatic influences in general, are of essential significance in beet culture; but these alone do not suffice; the nature and the quantity of the assimilable plant-supporting elements are points the importance of which cannot be overrated.

The warmth of the soil very greatly contributes to the formation of crystallizable sugar, as is plainly shown by a comparison of the products of the torrid with those of the frigid zone. The sugar beet, therefore, delights in a warm-bottomed soil, and in such ground grows richer in sugar than in what may be called cold soils, which are notorious for producing beets with very impure juices. On this account, also, lands with a western exposure usually produce better beets than those situated otherwise. Warmth increases the liveliness of a soil; the decomposition of carbonic acid, for instance, in plant growth, does not begin at a lower temperature than ten degrees. Expedients for increasing the warmth of the soil are, therefore, always of importance in beet culture.

The moistness of the soil has also a great influence upon the growth of the sugar beet. The presence of stagnant water in the subsoil is exceedingly injurious; the main root, which often penetrates to a depth of several feet, perishes, the plant assumes a sickly appearance, and the juice becomes watery, abounding in salts and so much the poorer in sugar. A warm, and at the same time moist soil, on the contrary, always produces rich juices, while too great dryness hinders growth and causes a small yield.

The meteorological conditions exercise an unmistakable influence upon the quality of the beet. The variations in the quality of the crop depend upon the rainfall and mean temperature of the season, wet and cold years producing beets of inferior quality, while warm and moderately dry weather (at least in Autumn) gives beets abounding in sugar and with juices easily refined. These influences upon the products of the year are plainly perceptible in all countries, and frequently make a difference of as much as fifteen per cent in the yield of sugar.

The caution has been often given not to grow beets upon new land, because the acids and undecomposed organic materials contained in it seem to work injuriously against the accumulation of the sugar in the beet. This, however, can of course only occur where we have to deal with utterly sour and, at the same time, wet or cold bottomed soils. On high lying, warm bottomed, new land, in southern Russia, I have found very excellent sugar beets, in quality evidently excelling those from ground longer under cultivation. Such land must, therefore, be by nature a favorable beet soil, "a born beet soil," as Fühling calls it. Soils of this character ought to be accurately experimented upon, and may be regarded as the type of perfection of a beet soil, producing sugar beets of the best quality without scientific culture and without manure of any kind.

The surface soil must be deep and strong enough, in order that the deep searching root of the beet may find abundant nutriment even in the lower layers. The tillage of the beet field is, therefore, often as much as eighteen inches in depth, and is usually performed in Autumn. The beet requires in the soil a quantity of soluble alkalies, the field is, therefore, deeply plowed in Autumn and left lying in rough furrows, so that the carbonic acid and oxygen of the air, the moisture of the rain and snows, and the action of the frost, may release the undissolved silicates in the soil, and by this weathering process render them available in suitable form for the requirements of the plant. This mechanical working of the land—the tillage—is, therefore, the best means of bringing the nutritive material present in the soil into a condition to be appropriated by the plants; and as this end will indisputably be more fully attained the better the land is tilled, the ground is plowed several times in Autumn, and the change of surface, the bringing of fresh layers of soil in contact with the air, have their natural result in an increased supply of soluble substances.

The first plowing of the stubble (if there has been a preceding crop) is, however, only shallow, so as to bring on quickly, by the action of air and moisture, the reduction by putrefaction of the organic material remaining to serve as food for a new growth of plants. This so-called stirring of the stubble takes place, therefore, immediately after the removal of the crop, in order to lengthen the time of this process as much as possible, and, by the aid of the comparatively high temperature still prevailing, to attain the result with greater certainty.

Late in Autumn, after the stubble, roots, and weeds are thoroughly decomposed, the land is usually plowed once more as deep as possible. This deep loosening up of the soil cannot be too strongly commended.

it appears, especially in beet culture, to insure the best results. Water penetrates this loosened layer, from which it cannot readily escape by evaporation, and thus forms a store of moisture which, especially in dry seasons, is of the most essential advantage to the beet, whose roots draw from below the supply which is denied to it from above. The deepened soil provides, therefore, in a measure, a reservoir against the time of drought, and, at the same time, a security against vicissitudes of weather, since, in heavy rains, it absorbs a larger quantity of water than ground plowed shallow. We find, in practice, that the deep Autumn tillage proves especially advantageous in dry seasons. I have seen, in such seasons, the crops upon the well cultivated lands of Madgeburg only five to ten per cent deficient, while other districts, with shallow plowing, have had to deplore, in many cases, a yield diminished by as much as thirty per cent.

In districts whose soil is not yet so deeply cultivated, a subsoil plow, for loosening up the lower layers, is, on the same account, to be recommended wherever the previous treatment has not been such as to admit taking a furrow of proper depth. The furrow remains rough during Winter, whereby the frost is enabled to effect, at the same time, the breaking up of the clods, whose smallest interstices are filled by the rain, which, expanding upon its conversion into ice, reduces the mass to the utmost extent. The fine, pulverized, mellow surface thus obtained affords the best possible seed bed for the reception of the beet seed, the earth particles in their then dry condition lying closely about the seed and promoting germination.

From what has been said, it is evident that good judicious working has the effect of making a good deal of nutritive material in the soil soluble, and so, to a certain extent, supplies the place of manure which the grower would otherwise be obliged to purchase.

A good and properly worked field can, therefore, produce as much with less as an ill worked field with more manure, or, what is the same thing, a field treated with an adequate quantity of manure will give a larger return in proportion as the Autumn tillage has been more judiciously and carefully performed.

The subsoiling of the stubble in the Autumn gives the ground, at the same time, that porosity and looseness which facilitates the constant penetration of air and moisture. The organic residue of the preceding crop (or of the manure) rots in the ground, and the gases thus generated induce a kind of fermentation which essentially contributes to the loosening of the soil. Every decayed or rotted stalk or plant fibre leaves behind it a passage, by which the air may penetrate and transmit the decomposing process even to the lower layers.

Digging the beet field was formerly very generally preferred; the plow, however, is not only a safer but also a cheaper implement, and, for extensive culture, is, moreover, the only practical one. Machinery triumphs here, as everywhere, over the more expensive hand labor. Its operation is such as to attain the various results desired. The plow gives greater security as regards the uniform and equally deep loosening up of the ground than unskilled laborers, and if the field has only been worked with a well-made plow in several different directions, lengthwise and crosswise, the mixing up of the soil will be tolerably uniform and thorough. The rapidity with which plowing can be performed renders the tillage of a larger surface possible in a short time, which in beet culture is much to be desired.

The working of the land in Autumn is universally recognized as advantageous, and commended by the observing farmer; the variety in the practical execution of it does not affect the estimate of its importance. If, however, the views of experts differ as regards the judiciousness of the deepest possible Autumn plowing, so also their opinions as regards the best mode of Spring cultivation are quite various. In the Madgeburg district they often go so far as to give no Spring plowing. The harrow and roller prepare the ground for the seed, and this is done with the view of retaining the moisture as much as possible in the soil. This is, however, only admissible where high farming keeps the ground free from weeds. In other districts the Winter furrow is leveled by the drag or harrow, the clods of earth having been first, where possible, crushed and pulverized by the roller, then grubbed and harrowed; sowing then proceeds, upon the completion of which the ground is rolled. In the case of fields that are very foul, a shallow plowing of the unweeded ground is, however, required, as the surest means for the destruction of its growth, and by which a fine and mellow seed furrow may even in such cases be obtained. It is true that in consequence the greater part of the Winter moisture may be removed from the soil by the sharp, drying, Spring winds; but, if the tillage be timely, rain soon replaces it, and the earlier coming up of the beet seed in advance of the weeds conduces to the certainty of the crop. In Bohemia, in many cases, they employ the cultivator with three or more teeth for the Spring tillage of the beet fields, in which a fine seed bed is thus quickly obtained.

In a few districts only is the seed furrow prepared with the spade and rake, since the expense of hand labor is too great to be generally profitable.

As the intelligent farmer, however, always cultivates his land, one rule is applicable in all cases, viz: Work the land as well before as during the growth of the beets, but never except in a dry condition. All work in wet ground injures more than it benefits; the ground in that case becomes sticky and compact, instead of remaining loose and penetrable by atmospheric agencies, and in such cases the young beet plants cannot thrive.

OF THE INFLUENCE OF THE PRECEDING CROP AND ON MANURING.

It may seem strange, perhaps, that I begin this chapter on manuring with the consideration of the preceding crop. When we consider, however, that what is left of the preceding crop—the stubble, for instance—is plowed under in working the soil, and, decaying, affords nourishment for a new generation of plants, we must, undoubtedly, regard these remains as a kind of manuring. The variable, but often very considerable, quantities which are left behind by any crop, account in part for the influence which the preceding growth exercises upon the beets which follow. The more there is left, so much the more decaying organic material, that is to say, manure, does the land contain, and not only so, but it will be in the same proportion more open and more exposed to atmospheric influences. All the influence of the preceding crop, to which, as regards the formation of sugar in the beets, so much consequence is frequently attributed, is not, however, thus to be accounted for; it results also from the attenuation of the nutritive material in the soil which it affects, and which is beneficial to the beets. It has, for instance, been established in all the various countries in which the cultivation of the beet has been intelligently practiced, that sugar beets, after rye, were not only richer in sugar than those grown after wheat, but also contained a purer juice; that is to say, freer from foreign substances. Indeed, it has even been sought to explain this fact by means of a theory, which I cite here on account of its singularity. It is asserted that all those plants, which, as maize, contain sugar, or, as wheat, contain starch, which is chemically the same as sugar, in large quantity, draw these substances from the soil, so as to impoverish it, and are, therefore, hurtful as crops to precede the sugar beet. This childish notion, however, is without any foundation, since, as is well known, rye contains just as great a proportion of starch in the crop as wheat. The reason for the beet being richer in sugar after rye, it seems to me, is to be sought elsewhere, and I will endeavor to explain it otherwise.

Some of the crops which we grow upon our fields require very concentrated and composite manures; others, quite the contrary. A single, heavy manuring, to suffice for several crops, appears, therefore, justifiable in practice, if we grow those crops in the same order of succession in which they stand as regards their requirement of manure.

This is, in fact, the usual practice, since wheat is commonly grown with fresh manure, with the nutritive material available for it in a concentrated form. If beets were grown immediately after the application of manure, they would draw upon the powerful decaying dung, which is strong in salts and organic material, and so develop an impure juice. The experience of many years proves that beets grown immediately after manuring contain large quantities of salts and albuminous compounds.

If beets are grown after wheat in the second year after manuring (as the second crop of the rotation), the root finds in the ground just so much less manure as the wheat crop has appropriated; the diminished quantity of nutritive material distributed over an equal area must, therefore, afford a more attenuated nutritive fluid to the fine root fibers of the beet; and if we admit that the osmotic capacity of the cellular structure of the beet appropriates different quantities of saline and albuminous matters according to the strength of the solution (as indeed their luxuriant growth with fresh manure seems to prove), it must be concluded that the juice of the beet the second year after manuring will be purer, that is to say, more free from saline compounds. Experience has long since shown that beets of the second year from the manure, are decidedly better for sugar making than those of the first.

We come now to the consideration of beets grown after rye, which, as is known, requires less concentrated manure. If, therefore, beets after rye usually contain a purer juice than after wheat, it is only because the soil contains its nutritive material in a less concentrated form; since in the first place the rye is less heavily manured, to start with, than the wheat, and besides a larger proportion of this diminished quantity of manure will have been removed by the rye crop. If this explanation has any degree of truth, it must follow that a field lightly manured for wheat as the preceding crop, will give a purer beet juice than a heavily manured rye field, and the quality of the beet will not directly depend upon the nature of the preceding crop, as has hitherto been commonly assumed. Some observations seem to support this view, and to indicate that the common notion as to the peculiar effect of rye as a preceding crop is founded only upon the custom of growing rye upon land more lightly manured than for wheat. We might, indeed, acting upon this theory, go to the extreme, and attempt to grow beets upon a field in very poor condition, in order to prove the correctness of views as yet merely theoretical.

On the other hand, it may be objected that the beet always requires a soil in good condition, and that the attenuation of the supply of nutriment should not be allowed to become so far homœopathic as to be prejudicial to the growth of plants, the extent of whose roots is limited. We may, indeed, assume that the beet, a potash plant, unquestionably requires a good deal of potash, but this does not prove that the beet requires a very strong potash solution for its development. In like manner, a potato crop withdraws from the soil more potash than a clover crop, for which the application of potash manure is required, while the potato thrives perfectly well with a smaller quantity of potash. We have even yet not discovered the limit of concentration within which manure for the beet may be most profitably supplied, and I am convinced that a very considerable advance must be made in this direction before we attain to the production of the beet, our raw material in the beet sugar manufacture, of the most suitable quality for this purpose.

Until the future has more completely lifted the veil which shrouds the mystery of the accumulation of sugar in the beet root, we cannot question the conclusion founded on experience, that they are best grown after a preceding crop.

The subject of the preceding crop in beet culture presents, however, other considerations which exercise some influence.

The most suitable crop to precede beets must, in fact, be that which puts the ground in the most suitable condition for their culture, that is to say, which leaves it free from weeds, and in such loose, mellow condition as to be easy to work. These conditions will apparently be, in general, best fulfilled by crops that are thick-leaved and cover the ground well, such as lupins, peas, vetches, and mixed or soiling crops. By the early cutting of the forage, the growth of weeds above ground is removed before the ripening of their seeds. An early plowing, for which in this case opportunity is afforded, effects the destruction of their roots and renders them even of use by their decay in the ground. Through the shading of the fields, by the effect of rains and dew, and of heat, the soil is put into a clean friable condition, promising a favorable growth of beets the following year, with little labor in weeding.

The favorable condition which the thick shading of the ground by the preceding crop produces, is shown in a luxuriant growth of the crop which follows a field of clover or lucerne, for instance, plowed in the second year after densely shading the ground, gives a favorable result; whereas, if plowed in the third year after depasturing, the ground is left exhausted, although in both cases the quantity of roots left in the soil is the same.

In fact, all crops cut green, leave a larger supply of manure in the soil than crops allowed to ripen, and, in consequence, the juice of the beets of the succeeding crop ought not, according to the theory above stated, to be quite so pure as after rye. This seems also to be verified in practice, and the growth of green fodder as the preceding crop, is, therefore, especially to be recommended on poor soils, provided we do not distribute the same quantity of nutriment among a large number of plants by having a thicker stand of beets.

But though the annual, thick-foliaged, succulent fodder plants are to be considered a favorable crop to precede beets, the more permanent ones, as clover, lucerne, asparagus, and the like, are not so regarded. It it asserted that insects collect under the sheltering shade of these plants, and pass thence to the sweeter, more palatable young beet plants, to regale themselves, to the great damage of the beet grower, upon the tender leaves as soon as they come out of the ground, and they often riot upon them to such an extent as to devastate whole fields. It has also been observed that beets, after clover and lucerne, are never so rich in sugar and free from mineral and organic matters as under other conditions.

There can, therefore, be no rule laid down, in regard to rotation, applicable to all cases; and this much only certainly results from the extended experience of all countries, that beets grown after an annual crop, as well as in the second year from manuring, are fitter for the production of sugar than those grown with fresh manure. It is reserved for the future to render the continuous growth of the beet practicable, by means of appropriate manurial agents; that is to say, to effect, by the use of suitable manures, what we have hitherto sought to accomplish by judicious rotation.

We pass now to some considerations regarding manuring, which has for its object to maintain the existing fertility in soils that are naturally good, or to restore to the soil, though in other form, those constituents that are withdrawn from it in the crop.

A soil, however rich, must finally become exhausted by the continuous abstraction of material in successive crops, and a diminution of fertility must sooner or later result. If, however, we restore these elements to the land, as we aim to do in the periodical manuring, the equilibrium which has been destroyed by the removal of many substances by the crop, may be thus reëstablished, and the fertility of the soil maintained, provided the supply is in exact proportion to the removal. On the other hand, if the supply of plant food (that is to say manure) be greater, the fertility of the land, and the yield of the succeeding crops may be increased.

The nutritive materials which we supply for plants are commonly designated as manure, by which term we understand all those substances which are requisite for the normal development of plants. Whether these are supplied in an unmixed condition, or in combination, they afterward undergo such a transformation, under the conditions prevailing in good soils, as to fit them to be taken up and assimilated by the plants.

Since, however, manure is the food of plants, its character must exercise an influence upon the composition of the plants produced. To show that this is actually the case, I will cite, from among many other proofs, but one instance of special interest to the sugar manufacture, in which wheat varied in composition according to the manure, as follows (1): One hundred pounds of grain from the same soil contained:

Manured	with	blood,	starch	41	per cent,	gluten	34	per cent.
"	"	sheep dung,	"	42	"	"	33	"
"	"	horse manure,	"	62	"	"	14	"
"	"	cow dung,	"	62	"	"	12	"
"	"	vegetable manure,	"	60	"	"	18	"

These facts are of importance to beet sugar makers, since the quantity of sugar in the beet will vary in the same manner as that of starch in wheat; and the proportion of nitrogenous substances in the beet, just as in the wheat, will be dependent upon the manure.

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(1) Cuthbert W. Johnson; The Fertilizers, page 41.

If, however, as is plain from what has preceded, the plant varies in its constituent proportions according to the manure applied, it must be concluded that a certain proportionate composition of a plant demands *a priori* the presence in the soil of the requisite material; and since the ash of a plant shows what mineral elements are required for its development, we are thus naturally led to infer, from the composition of the plant-ash, the nature of the manure which we have to employ for the production of that plant.

To apply this proposition to the growing of sugar beets, the first question is, what substances does the beet contain? Several chemists give their composition as in the following tables:

According to Bretschneider, eighteen hundred and sixty, the beets upon a Madgeburg morgen contained, in the crop, the following quantities of mineral substances:

	Roots.	Leaves.	Total.
Potash	56.7 lbs.	33.7 lbs.	90.4 lbs.
Chloride of lime	6.3 "	17.7 "	24.0 "
Carbonate of soda	4.0 "	9.7 "	13.7 "
Lime	8.3 "	27.1 "	35.4 "
Magnesia	13.5 "	24.5 "	38.0 "
Phosphoric acid	22.9 "	13.6 "	36.5 "
Silicic acid	3.9 "	8.3 "	12.2 "
Oxide of iron	1.5 "	1.8 "	3.3 "
Sulphuric acid	11.5 "	12.4 "	23.9 "
	128.6 lbs.	148.9 lbs.	207.75 lbs

TABLE

Showing the quantities of mineral and nitrogenous substances in the beet crop, according to various authorities.

	THE YIELD OF ONE MAGDEBURG MORGEN (= 150 CENTNERS OF BEETS) CONTAINED, ACCORDING TO—												THERE WERE, ACCORDING TO—				
—	Dr. Emil Wolf.			Karmrodt.			Fuhling.			Hoffman.			Bret-schneider.	Hera-path.	Griepen-kerl.	Boussin-gault.	Spren-gel.
	Roots, pounds..	Leaves, pounds.	Total pounds...	Roots, pounds..	Leaves, pounds.	Total pounds...	Roots, pounds..	Leaves, pounds.	Total pounds....	Roots, pounds...	Leaves, pounds.	Total pounds....	In 100 parts beets	In 10,000 parts beets	In 10,000 parts beets	In 10,000 parts beets	In 10,000 parts beets ....
Potash	40.5	34.1	74.6	49.4	30.0	79.4	61	35	96	50.9	24	74.9	2.3 }	53.46	51.1	49.7	36.27
Carbonate of soda...	16.4	11.3	27.3	6.4	8.9	15.3	25	12	37	5.7	13	18.7	1.4 }		....	1.91	....
Lime	6.2	10.5	16.7	6.7	8.1	14.8	9	11	20	9.8	18	27.8	0.4	20.24	2.45	8.91	15.00
Magnesia	4.3	8.8	13.1	7.0	4.2	11.2	6	9	15	6.7	17.7	24.4	0.5	2.7	2.9	5.6	5.4
Chlorine.................	11.8	13.4	25.2	5.6	10.4	16.0	18	14	32	1.9	5	6.9	0.1	....	....	....	....
Sulphuric acid	3 5	5.1	8.6	2.7	2.8	5.5	5	5	10	4	7.4	11.4	0.4	8.3	2.3	2.04	6.3
Phosphoric acid......	6.4	7.3	13.7	12.3	5.8	18.1	10	8	18	16.3	6.9	23.2	0.8	7.6	10.8	7.6	4.5
Silicic acid..............	7.5	8.0	15.5	3.1	8.6	11.7	11	8	19	3.4	5.9	8.5	0.2	Trace.	0.2	10.2	2.7
Oxide of iron..........	....	....	....	2.13	1.12	3.25	.....	.....	....	1.1	2.3	3.4	0.04	....	0.35	3.18	0.32
Total mineral constituents..............	....	....	194.7	96.5	81.0	177.5	.....	.....	247	....	....	199.2	6.2	....	....	....	....
Nitrogenous organic matter	....	....	....	119.6	108.0	22.76											
Chloride of sodium..	....	....	....	....	....	....	.....	.....	....	....	....	....	....	....	....	....	....
Chloride of potassium...........	....	....	....				.....	.....	....	....	....	....	....	8.15	17.04	10.83	11.30
Dry substances.......	....	....	....	3,324.9	5,280.0	3,852.9	.....	.....	....	....	....	....	....	....	12.85	....	....
Containing nitrogen.	....	....	....	19.1	17.3	36.4	23	16	39	....	....	....	....	....	....	....	....

From the figures here given, what most strikingly appears is the great diversity in the statements, from which it must be concluded that up to this time a sufficient number of accurate analyses has not been given to enable us to arrive at definite results. The preceding analyses are certainly not all of sugar beets of the best quality, and the sugar manufacturer cannot draw conclusions from statements based on examinations of unsuitable material. It is, moreover, not yet fully determined whether it is indispensable that all the substances mentioned in the foregoing comparisons shall be present in the proportions stated. In order to solve this problem, it must first be ascertained what are the smallest quantities of these salts necessary for the growth of the sugar beet. Indeed, it is even conceivable that some of the elementary substances above enumerated might be advantageously replaced by others of a similar character, as, for instance, the carbonate of soda by potash, or the lime by magnesia; although the experiments in this direction with many plants have given a negative result, or would seem to show that the substitution is only allowable with narrow limits. Moreover, it is known that analysis detects saltpeter in some beets, while others contain none, which goes to prove that saltpeter is a non-essential constituent of the beet, although frequently found in it.

The number of analyses of sugar beets of the best quality must first be multiplied before we can determine from them the essential constituents of the beet, and thus be enabled to select the most appropriate manures.

But should all these questions be solved, there would still remain many and serious difficulties in the intelligent cultivation of the beet for experience to remove. If we assume, for instance, that the crop of beets, including the leaves, removes one hundred and seventy-five to two hundred and forty-seven pounds of mineral substances per Magdeburg morgen, it must next be determined how much of the manurial substances intended to replace them is capable of becoming soluble in the ground in the course of four months, so as to be taken up by the plants at the right time, and to become applicable to their nourishment. If, for instance, the character of the manure be such that only a quarter of the whole mass will become soluble in that time, it will then be necessary to supply (4×175) seven hundred, or (4×247) nine hundred and eighty-eight pounds, as a dressing, to effect the desired result.

Meteorological phenomena, however, and especially the rainfall, greatly affect the question of solubility. If, for example, the intelligent cultivator has correctly computed how much of the nutritive material in the soil will be dissolved with the ordinary quantity of rain, yet the occurrence of a heavier rainfall may dissolve more, even considerably more, of these salts, and so cause more of them to pass into the beets than is desired by the sugar manufacturers, as their frequent complaints in rainy seasons testify. Large quantities of manure, with an excess of such substances as, under ordinary conditions, remain insoluble, will, under other circumstances, part with either too much or too little of these substances in solution, according as more or less rain falls. Could we supply the whole desired quantity of such nutritive substances in perfectly dissolved condition, and at the same time not in excess, for the crops hereafter to be grown, then, indeed, these unfortunate results might cease to be apprehended, in so far as the manuring may be the cause of them. The perfectly uniform intermixture of the manure in the surface soil would, however, even then remain a matter of greater difficulty than it is now; and the fact that plant food is accumulated in the soil in greater quantity at one place than in another is, beyond all question, the cause of the diversity of composition of individual specimens of beets, which is so frequently found in practice. More frequent plowing of the field lengthwise and crosswise, as is frequently practiced in the Magdeburg district, is, therefore, to be strongly recommended, and on this account also, the second year after manuring is preferable for the beet crop, because the greater number of plowings in the course of two years, intermix and distribute the manure more uniformly in the soil. Supposing, however, all this happily accomplished, the beet grower is not even then certain whether the substances supplied are conveyed actually or principally to the beet roots, as the product chiefly desired, or rather promote the growth of leaves, since it appears proved by all field experiments, that a large part of the manure employed, goes to increase the product in leaves in a greater degree than in roots.

Although, therefore, it is now upon the whole established, that everything that has been taken from the soil must be returned to it, there yet remains the diverse effects of different manures to be considered, so that numerous practical experiments must still be made with the nutritive substances up to this time recognized as essential, and which we apply to the soil as manure, before we can regard this important question as solved. Such manure experiments, in the case of each individual manufacturer and for his particular soil, are the more necessary, since different soils afford a greater or less proportion of prepared plant food, which directly contributes to the growth of the beet.

Taking the soil analyses given in a former chapter as the basis of our observations, it appears from them that one thousand parts of earth contain 99.2 to 195.4 parts of possibly soluble mineral substances. A Magdeburg morgen (of one hundred and eighty square ruthe) has in ten inches of depth about two million pounds of soil, or about two hundred thousand pounds total soluble mineral substances, while a beet crop, according to the foregoing analyses, requires as a maximum only two hundred and forty-seven pounds. If of those two hundred thousand pounds (which may, perhaps, be over-estimated) only one fifth, or forty thousand pounds, come within reach of the roots of the beet plants, there would be more than sufficient nutriment to produce beets during many years, provided these mineral substances could all be put in a soluble form. Since, however, the question of the greater or less solubility of these nutritive materials in the soil is not determined beforehand, and consequently the requisite quantity of soluble manure cannot be calculated, it must be ascertained by the results of experiments in the field.

A dressing of three hundred pounds of guano, for instance, though a very heavy one, contains only thirty to fifty per cent, or say one hundred and fifty pounds, of earthy or mineral substances; four hundred pounds of rape cake, at thirty-four per cent, only one hundred and thirty-six pounds, and so on. That such small quantities, even if they were entirely soluble, must under all circumstances be of little consequence, as compared with the large quantity, partly of natural origin and partly from previous manuring, of mineral substances in the soil, is very evident. I consider it, therefore, equally plain that the soil controls the action of the manure, since the same dressings produce different results on different soils, or soils with very dissimilar quantities of soluble mineral substances. It by no means follows from this, however, that the manure is without influence upon the composition of the beet (since an injudicious manuring may, as every practical man knows, seriously impair the quality of the beets upon the best soil), but only, that we are not to expect everything from the manure, and that the soil and tillage are always of more consequence.

The field experiments, which have been frequently made with various manures in the same season, appear to me, however, to be not yet sufficient to enable us to determine finally the value of any manures. Under such conditions, the quality of the soil and the very soluble manurial substances remaining from former manurings, the "old strength," as it is called, of the soil, all exercise too great an influence, not to mention that of the incidental meteorological conditions of the season. The results of most experiments with manures, confined to a single year, are, therefore, the product of several factors, of which the manure is but one. They cannot alone, therefore, be a sufficient guide in the discrimination of manures.

Manures rich in ammonia, and nitrogenous manures in general, have a very marked effect in beet culture; they greatly promote the growth of the roots, but, unfortunately, with the increased supply of nitrogen in the manure, an evident increase is observed of nitrogen in the beet.

According to Lawes' and Gilbert's experiments, the amount of nitrogen in the dry substance of the beet was:

With mineral manure (mean of thirteen experiments)......	1.50 per cent.
With mineral manure and rape cake..............................	1.91 per cent.
With mineral manure and salts of ammonia.....................	2.86 per cent.

In the parliamentary report on the growth of sugar in Ireland, it is stated that the influence of the manure on the amount of nitrogen in the beet, in the investigations directed to this point, is very marked, and the conclusion is drawn that no good farmer should apply fresh dung to his land for the beet crop. Bretschneider confines himself to the simple statement of the fact, that, in contradiction to general experience, beets containing much more nitrogen were produced, in eighteen hundred and sixty-one, upon a soil containing 0.164 per cent of nitrogen than upon a soil in which only 0.085 per cent of nitrogen could be found.

Moreover, since we can enhance the product of the beet crop only in quantity by the supply of nitrogen, we should employ this agent but sparingly in the interest of the sugar manufacture, so long as we are unable, by means of a quick separation of it in the process of manufacture, to prevent the injurious effect of the fermenting agent which is thus produced, or at least augmented, in the beet juice. Animal charcoal acts but feebly as an absorbent of this substance, while lime, indeed, separates a part of it, but the residue, for the most part, is not capable of removal, although the lime acts destructively upon it in the whole course of the manufacture, as the ammonia smell of the juice proves. It remains for the advancing intelligence of the future to discover a process by which we may be enabled to remove or to render innocuous, in a quick and easy way, all these nitrogenous matters which have a similar composition to albumen, blood, etc., and which we frequently designate, collectively, by the term proteine substances.

So long as the chemistry of the sugar manufacture has not accomplished this step in advance (which ought not to be much longer delayed), so long nothing remains to the beet grower but to diminish the formation of these constituents, by means of a suitable dressing with but little nitrogen, in the second year of the rotation, even at the expense of the yield of beets.

Various kinds of manure, however, operate more or less favorably as regards the development of fermenting agents in the plants; for instance, human excrement causes a great accumulation of them, cow dung less, rape cake still less, etc.

Besides the substances previously mentioned, carbonic acid evidently performs an important part in the production of good sugar beets. The carbonic acid of the air, which constitutes about fifteen one hundredths of its weight, is absorbed by the leaves, and by the aid of sunlight is decomposed, so that carbon remains, which in all plant formations constitutes the predominating element of their bulk. Direct investigations have been made with other plants upon the absorption of carbonic acid. The grape, for example, in a vessel through which air containing 0.00045 parts in volume of carbonic acid was conducted, absorbed so much of it that the air, at its exit, contained only 0.0001 to 0.0002 parts. It would be equally interesting as important, in comparison with such experiments upon the influence of carbonic acid upon the leaves, to study closely its effects upon the underground part of the plant, especially of the beet. Moreover, we create in the soil an artificial atmosphere of carbonic acid, which is supplied to the organs under ground that correspond to the leaves, and by the aid of the necessary mineral substances, is employed in the formation of new constituents of the plant. In addition, the carbonic acid in the soil effects the solution of various salts previously insoluble (especially the combinations of phosphoric acid, according to Dr. C. Wolf), which in their dissolved condition, must be very acceptable to the little fibrous beet roots, that seek their food near at hand. This important agent of the plant growth, carbonic acid, we can only avail ourselves of, in the periodical manuring, by means of the decomposition of decaying vegetable substances in the soil; it is, in almost all applications of manures for sugar beets, regarded only as an accessory, whether rightly or wrongly, remains to be decided by careful experiments.

All persons, however, whether practical or theoretical, agree, as regards the question of the operation and profit of manuring, upon the following maxims, applicable to all manures of equal cost: (1) that the crop is increased in quantity by manuring, but that (2) the heaviest possible manuring does not give the greatest net profit, and that therefore (3), to every soil the quantity of manure required by its condition as ascertained by experiment, and no more, is to be applied in order to manure with profit.

The proportion of weight of leaves and roots is very remarkable for the wide limits within which it varies, so that even an approximately correct estimate of the weight of the beet from the strength of the leaf-growth, is rendered impossible. The weight of the leaves may, for instance, amount to from thirty to eighty per cent of that of the root, and since the latter furnishes the only valuable material to the sugar manufacturer, the scales alone can determine the magnitude of the crop.

The following field experiments of Laws and Gilbert, furnishes a striking illustration of the decrease of the yield of beets from a soil without the application of any manure:

YEAR.	Experiment	Yield of beets per hectare, in kilogrammes.		
		Without manure.	Manured with—	
			Superphosphate of lime.	Superphosphate of lime, potash, soda, and magnesia.
1843	1	10.490	30.502	29.741
1844	2	5.541	19.380	14.244
1845	3	1.707	31.773	31.630
1846	4	....	4.758	8.791
1847	5	....	18.903	14.527
1848	6	....	26.433	24.857
1849	7	....	9.392	9.214
1850	8	....	28.678	23.463
—	......	....	20.603	19.482

N. B.—The unmanured field in the fourth year gave a crop so small that it was not worth weighing.

It thus appears that the capacity of the soil for producing beets rapidly declines without manure, but that fertility can be in some degree maintained even by such a partial manuring.

Manures may be incorporated with the soil in different ways; that is, distributed either over the whole ground or in the rows close to the seed.

Almost all dressings are spread over the whole surface, and intermixed with the soil as uniformly as possible. Local manuring is, however, rightly employed by some who desire to supply a very powerful aliment, abundantly present, directly to the roots of the young plants, by means of which they sooner gain strength, more quickly throw out luxuriant leaves, and are thus better prepared to draw nourishment from the atmosphere, and to withstand successfully injurious climatic changes. This local manuring, which can be easily performed by machines at the time of sowing the beet seed, renders a great economy of concentrated manures possible, since they are beneficial only in the immediate neighborhood of the young plants, and not in the wide spaces between the rows. Repeated experiments prove that we can attain far better results in this way, with half the quantity of manure that the distribution over the whole field would require, than with the whole quantity in the other way.

Some precaution is required, however, as to the way of depositing the manure with the seed. Many of the so-called artificial manures are injurious to the germs (as guano, rape cake, etc.), and it is, therefore, essential not to bring the seed and manure into direct contact. The machines, therefore, deposit the manure, usually, deeper; some earth, then, falls upon it, and upon this the seed drops. If this local application of manure be only moderate in quantity, and not so heavy that the manure, by gathering in lumps, may hinder the penetration of the roots, and if, in addition, we use only such manure as, like bone dust, does not affect the germination of the seed, this plan is highly to be recommended as truly profitable. Small quantities of bone dust are in this way often of considerable effect, as is shown by a rapid and strong early growth of the plant, the advantage of which is well known to the experienced beet-grower, for he knows that the quicker the plant grows at the outset, the quicker it gets out of danger from insects, and the more will its early developed leaf organs not only promote the formation of sugar in the beet, but also by their shade protect the soil from drought. Solubility of the manure is also in local manuring an essential to the rapid growth of the plant. What and how much assimilable manure the beet requires for each stage of its development may, perhaps, be learned from analysis at different periods of its growth. According to Bretschneider, beets contained per Magdeburg morgen as follows:

	Compounds containing nitrogen...	Cellulose....	Sugar	Ash	Other constituents..	Total ....
	Pfd.	Pfd.	Pfd.	Pfd.	Pfd.	Pfd.
On July 20th..............	39.86	22.49	86.68	15.66	49.52	214.20
On August 9th	141.82	75.12	355.26	57.73	135.67	759.60
On August 31st............	267.28	147.31	1,035.96	118.20	206.05	1,774.80
On September 15th......	342.79	193.96	1,464.60	116.75(?)	207.44	2,325.00
On September 30th......	403.40	215.32	1,921.67	125.48	232.13	2,898.00
On October 16th..........	431.27	215.64	2,244.01	128.64	339.24	3,358.80

In the same proportions in which the beet takes up these substances, they must consequently have been present in the soil in solution. Of the inorganic constituents, for instance, almost the whole had been already taken up by the end of August, by which the opinion already expressed is confirmed, namely: that a large quantity of *soluble*, assimilable, nutritive material, present at the very first in the soil, greatly accelerates and invigorates the otherwise very tardy early growth of the beet, and that in consequence a better quality of beets may, perhaps, be produced, since a more rapid growth of the plant when young may be considered equivalent, in its general effect, to lengthening the growing season.

That the substances required for the growth of the beet plant should likewise be supplied in those combinations in which they are not detrimental to the process of manufacture, follows from the very object of the beet grower—the production of sugar. The beet grower, therefore, prefers to supply the potash, for instance, not as saltpeter, or in the form of muriate, but in combination with carbonic or phosphoric acid, as can very easily be done, and whereby he essentially contributes to the easier working of the juice, and also to a frequently not inconsiderable increase of the return in sugar.

The substances applied to the land as manure vary very much, according to local conditions. We may here briefly consider the most common of them.

Green manuring appears earliest known and employed. Nature suggested it, so to speak, in her woods and meads. The ancient Romans, it is said, plowed in lucerne, in the second year, for manure. In China and North America, it is said, red clover is not cut, but plowed in for manure. In some districts of North America, they are said to grow Indian corn two or three times in one season, on the same exhausted land, and each time immediately plow in again the green, thick-leaved plants to supply more manure to the soil. In England, Germany, and France, buckwheat, Winter tares or fodder, rape, clover in its after-growth, lupines, asparagus, etc., are employed for the same purpose. The plowing in of these plants takes place when they are beginning to blossom, when the warmth of the air and of the soil promotes a rapid decomposition of the juicy vegetable matter, which, distributed over the whole soil more uniformly than any other manure, supplies to the ground, by its decay, a mass of organic nutriment, three fourths of which, as is assumed, is derived from the atmosphere.

The decomposition of these green plants in the soil itself, imparts to it almost entirely the resulting gaseous products, such as ammonia, carbonic acid, etc., whereas the decomposition of all other kinds of manure is usually attended with considerable loss.

Green manuring appears especially to be recommended for its influence on the quality of the sugar beet, since it has no heating effect and does not impart to the beet any excess of those substances, whether of organic or inorganic origin, which afterward so much impede the crystallization of the sugar. In the interest of the manufacturer, a beet grown with green manure is, therefore, more desirable than one produced by the aid of other manures.

Whether a green manuring is profitable to the farmer must be decided with reference to the locality. It certainly appears to be of considerable profit in those sparsely populated countries, like Hungary, Russia, etc., where rent is cheap and labor dear. It saves the expense of cutting and carrying the crop, and the subsequent spreading of the manure, besides which artificial manures, in such countries, are usually rendered much more expensive by imperfect communication. Moreover, in southern countries a broad leaved crop can be grown immediately after the completion of the harvest, and plowed under late in the Autumn. In this way it is possible to increase the productiveness of a poor soil for the beet crop at a very slight expense.

The effect of green manure may be considered equal to that of such a quantity of cattle manure as would be produced by three times as much green food.

Stable dung is, in all countries, altogether the most usual kind of manure. It contains almost all the constituents required by the plants in ordinary cultivation, and which ordinary crops remove. The use of fresh stable manure, however, produces, indeed, a greater quantity of beets, but, at the same time, a very impure juice, abounding in extraneous organic and inorganic matters, and from which, consequently, less crystallized sugar is obtained, under the present processes of manufacture, by which we are not yet enabled to separate these foreign matters perfectly.

Although the composition of the beets grown with fresh manure, and their value for sugar making, may vary considerably, according to the particular character of the soil, yet in most cases, as already remarked, the growth of beets with fresh manure for the manufacture of sugar is unprofitable. All intelligent manufacturers in beet-sugar producing countries agree that it is more profitable to grow the beets the second year after manuring, after a crop allowed to ripen has taken from about fifty to sixty per cent of the manure and left the decomposed manure in the soil in a less concentrated condition.

Beets grown in this way, with older or less powerful manure, are preferable to those grown with fresh manure, with which, it is usually to be apprehended, that the abundant fermenting agents in the juice may affect the sugar and induce an imperfect separation. On account of the great purity of the juice of the beets grown the second year, a more perfect separation of the saccharine matter is accomplished in their manufacture, and a higher yield of sugar is obtained from them than from beets grown with fresh manure, in whose juice a quantity of salts and proteine substances obstinately remains, even after the employment of the most approved processes, the crystallization of a large part of the sugar being thus prevented, and the resulting percentage of hard sugar much diminished.

The composition of stable manure, of course, varies according to the litter with which it is mixed, according to the quantity and composition of the food supplied to the stock, and even according to the breeds of the animals, and its age, and the manner in which it has been kept.

One hundred parts of tolerably old horse manure, according to Colbeck and Richardson, contain, approximately:

Carbon	13.21	Organic matter	24.71
Hydrogen	1.86		
Nitrogen	0.62		
Oxygen	9.02		
Potash	0.33	Unorganic substance	10.06
Carbonate of soda	0.29		
Lime	0.99		
Magnesia	0 19		
Oxide of iron	0.21		
Phosphoric acid	0.81		
Sulphuric acid	0.33		
Carbonic acid	0.52		
Muriatic acid	0.33		
Silica	2.78		
Sand	3.28		
Water			64.96
			99.73

The manure may again be composed of the solid and fluid excrements of domestic animals used separately. Rogier gives the composition of the solid excrements of the animals below mentioned, as follows:

	Pig dung, per cent.	Cow dung, per cent.	Sheep dung, per cent.	Horse dung, per cent.
100 parts of fresh manure contained water	77.13	85.45	56.47	77.25
100 parts of dry substance gave of ash	37.17	15.28	13.49	13.36
100 parts of ash contained:				
Potash	3.60	2.91	8.32	11.30
Carbonate of soda	3.44	0.98	3.28	1.98
Chloride of sodium	0.89	0.23	0.14	0.03
Phosphoric acid and oxide of iron	10.55	8.93	3.98	2.73
Lime	2.03	5.71	18.15	4.63
Magnesia	2.24	19.47	5.45	3.84
Phosphoric acid	0.41	4.76	7.52	8.93
Sulphuric acid	0.90	1.75	2.69	1.86
Carbonic acid	0.60	....	....	....
Silicic acid	13.19	62.54	50.11	62.40
Sesquioxide of mangagese	....	....	....	2.13
Sand	61.37	....	....	....

From this comparison it may easily be seen how different manures produce different effects on the quality of the sugar beet.

Cow dung and horse dung give experimentally better sugar beets, than pig or sheep dung. In the two last there is accordingly a decidedly larger quantity of carbonate of soda, which so much impedes the crystallization of the sugar, than in the two others, and on the other hand less phosphoric acid, which in practice is found to favor the early growth of the beet.

The fluid excrements abound in easily assimilated substances, and are an excellent fertilizer. Payen found in the urine of cows 1.5 per cent of nitrogen. In that of horses, according to Boussingault, there are 1.5 per cent of nitrogen; and in human urine, 1.5 per cent. A given weight of urine should, therefore, produce a larger yield than five times the weight of stable manure. Sugar manufacturers use their coal or peat dust or rubbish to the best advantage, as an absorbent of urine, thus obtaining a pulverized manure very valuable for sugar beets, and also inodorous.

Bones, when ground, have a special value for the production of sugar beets, since experience has everywhere proved that beets from fields manured with bones are much more solid, keep better in Winter, and are easier to manufacture, than those produced with other manures.

They contain:

Phosphate of lime	51 to 58 per cent.
Carbonate of lime (and magnesia)	6 to 8 per cent.
Organic matter (With four to six per cent of nitrogen.)	24 to 58 per cent.

That the phosphoric acid, in which bones are often twice as rich as guano, is the essentially effective component of them, is shown by the evident effect upon some soils, which probably were very deficient in phosphoric acid, of calcined bones, which could not develop any ammonia. Steamed and finely ground bones, moreover, produce a quicker and better effect than unsteamed crushed bones, although the latter contain more lime (as well as substances yielding ammonia).

The usual quantity of bone meal as a dressing is from two hundred to three hundred pounds per Magdeburg morgen. Too large a quantity appears not to effect a corresponding increase of the crop. In order to promote its solubility in the soil, it is frequently dissolved by means of sulphuric acid, which combines with one half of the lime to form a sulphate, while the remainder is converted into bi-phosphate in a form easily assimilated by plants. The treatment with muriatic acid appears to me less to be recommended. The least expensive, and, perhaps, most rational preparation of the very finest bone meal is, however, to moisten it with suds after having mixed and covered it with mold or straw chaff. In this way, to bones which contain but one third as much nitrogen as guano, such a quantity of nitrogen may be supplied as to make them equal to the best fertilizers. A fermentation or putrefaction is, moreover, by these means brought about, by which the bone meal is dissolved and so converted into a readily soluble nutriment for the plants.

The use of pure ground bones, in connection with stable manure, is strongly to be recommended. Even quite large pieces of bone will become decomposed if mixed with horse manure and left for some time to ferment in the heap. The result of mixed manuring is in all cases more certain.

According to Dr. E. Wolf, there were produced:

By one hundred kilos. of bone dust (mean of thirty-five experiments)	1.952 kilos. of beets.
By one hundred kilos. of bone dust with sulphuric acid (thirteen experiments)	8.229 kilos. of beets.
By one hundred kilos. of bone dust with muriatic acid (four experiments)	10.224 kilos. of beets.
By one hundred kilos. of calcined bones (fifteen experiments)	2.107 kilos. of beets.
By one hundred kilos. of calcined bones with sulphuric acid (three experiments)	7.782 kilos. of beets.

In England they consider sixteen bushels (of forty-seven pounds) of bones per acre a very heavy dressing, and eight bushels, if mixed with other manure. (1)

Guano is an excellent fertilizer for beets, since it is suited to all soils, easy to transport and certain in its effect. It is mixed with earth in a moist condition, spread by hand and lightly covered.

Its composition varies very much. Different qualities contain:

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(1) There has lately been brought to market a yellowish white or gray mineral under the name of sombrero phosphate, containing sixty to eighty per cent of phosphate of lime, and, when dissolved by sulphuric acid, furnishing a substitute for bones.

Water	6 to 40 per cent.
Combinations of ammonia (three to seventeen per cent of nitrogen)	20 to 66 per cent.
Earthy phosphate	16 to 70 per cent.

Its value is greater the more ammoniacal and phosphoric combinations it contains, and the less it has been exposed to rain. It is especially effective in wet weather, but acts very injuriously upon the germination of the seed, with which it should, therefore, never be brought in direct contact; when added to other manure, at the rate of about one hundred pounds per morgen, it always gives a surer crop; when used in connection with bonedust, it is very much to be recommended for sugar beets, since, in consequence of the ready solubility of its nitrogenous substances, it supplies the necessary nutriment to the beets when young, and, during the time of ripening, does not act so powerfully. Beets grown with a mixture of guano and other fertilizers are less difficult to manufacture, when the quantity of guano is not too large.

Rape cake is composed of:

Hulls and woody fiber	25.0
Sugar, dextrine and pectine	17.7
Nitrogenous substances	20.8
Oil	12.8
Water	14.9
Ash and sand	8.8
	100.0

Rape cake is a very quickly acting, easily transported manure, which should be plowed under about three inches in depth, in Spring, some days before sowing, since, when fresh and in immediate contact with the seed, it is injurious to the germ. From the ease with which it decomposes, it affords an appropriate nutriment to the young plants in the early stage of their growth, without the salts which are injurious in the manufacture. It is particularly effective in wet seasons or after rain, but does not show its effect so perceptibly in dry years.

The quantity employed as a dressing for beets is from two hundred to eight hundred pounds per Magdeburg morgen, according to the condition of the land. It should, however, be observed that rape cake has a strong effect in attracting insects to the beet field, and sometimes does harm in this way.

The use of bone dust gives the best results as regards the quality of the beet for the manufacture of sugar, and its general use appears thus fully justified. The sugar manufactory at Czakowitz, in Bohemia, has employed this fertilizer to the greatest extent, perhaps, in the world, and thereby firmly established a system of beet culture which may be taken for a model.

Ashes cannot properly be considered as a complete manure, since they consist entirely of mineral substances, and the supply of these alone cannot afford a sufficiency of the nutriment required by the sugar beet. Their use can only be advised in small quantity as an auxiliary in beet culture; in large quantities they produce beets containing such an amount of salts that they are very difficult to manufacture.

The composition of the ash of the beech (firewood) is given by Dr. G. Heyer as follows:

Oxide of iron	0.5
Sesquioxide of manganese	0.9
Calcareous earth	39.7
Magnesia	10.0
Potash	13.2
Carbonate of soda	3.0
Silicic acid	6.2
Phosphoric acid	6.0
Sulphuric acid	0.5
Chlorine	0.06
Carbonic acid	19.6

Lime often produces quite an excellent effect on sugar beets, although it is, properly speaking, not a direct fertilizer. It not only combines with such free acids as there may be in the soil, and thus renders them innocuous, but operates, also, by decomposing the slowly soluble organic and mineral compounds which the soil holds in store, and converting them into soluble plant food; it thus renders this wealth lying dormant in the soil active and available, and it promotes, also, the quick turning of capital, a matter which the mercantile world of the present day considers of the utmost importance. Lime is, therefore, often a very valuable agent for the sugar manufacturer, who must have beets, and, in fact, good beets, and the sooner the better, and it is only liable to act injuriously when applied in such large quantities as to develop more ammonia from the organic matter in the soil than it is able to retain. The proverb, "Lime makes rich fathers and poor sons," is not true in the case of sugar manufacturers, for the son must of necessity be rich if the father is; and the effect of lime ought, therefore, not to be regarded as a premature exhaustion of the resources of the soil, but rather as bringing into active employment that which has been hitherto dead capital.

Lime is evidently of no value, except where many undecomposed mineral and organic matters exist in the soil, and where the soil is not naturally lively and warm enough for these valuable substances to become effective of themselves without a stimulant. Lime is, therefore, only a means of rendering fertilizers available as quickly as possible, for which purpose it is often added to the compost heap.

I have often found the quality of beets, as regards sugar making, very much improved by the application of lime; as, also, that beets from all soils, naturally rich in lime, contain a very pure juice.

The various matters constituting the refuse of the beet-sugar manufacture form valuable fertilizers, since they return to the land at least a part of the nutriment taken from it.

Dried scum contains, according to Doctor Hoffman, in one hundred parts:

Water	4.45
Mineral substances	50.7
Organic substances	44.85
	100.00

Carbonate of lime	16.60		
Lime	17.36		
Magnesia	1.90		
Clay and oxide of iron	8.00		
Carbonate of soda and potash	0.39		
Chlorine	trace.		
Sulphuric acid	0.05		
Phosphoric acid	1.60		
Organic matter	44.85	Nitrogen	1.579
		Albumen	9.995
Water	4.45		
Loss	4.50		
	100.00		

In different factories, however, this composition varies very much, according to the quality of the beets, the quantity of lime used, the method of separation, etc. One hundred pounds of beets give at the most two to three pounds of moist scum, or of dry (with about four per cent of water), about one and a half pounds. As a fertilizer it has an excellent effect.

The residuum of the saturation process is even more insignificant, being about eighteen one hundredths of one per cent. Its composition, according to Doctor Hoffman, is:

Carbonate of lime	59.09	Nitrogen	0.65
Lime	3.16		
Sulphate of lime	0.68		
Oxide of iron (clay)	3.75		
Organic matter	27.32		
Residue insoluble in muri. acid	1.00		
Water	5.00		
	100.00		

The molasses varies according to the kind of beets and the method of manufacture. It gives about nine and a half to ten per cent of ash, of which alkalies constitute ninety per cent. The composition of the ash is given by Doctor Bretschneider, as follows:

Silicic acid	0.32	
Oxide of iron	0.08	
Lime	0.29	
Magnesia	0.78	
Chloride of sodium	22.81	22.81
Potash	57.96	67.38
Carbonate of soda	9.42	
Phosphoric acid	0.85	
Sulphuric acid	1.59	90.19 alkalies.
	100.00	

The quantity of nitrogenous organic matter in the molasses varies considerably, from an inappreciable quantity up to twelve per cent, and to this may probably be ascribed the various values assigned to it as a fertilizer in different districts. It certainly cannot be without any fertilizing value, since it contains various alkalies which, partly as direct, but especially as indirect, aliment, exert a very beneficial effect, whether applied in concentrated solution or in the form of ash, in liberating the mineral constituents of the soil and hastening the decomposition of organic matter. One hundred pounds of beets give about two and one half pounds of molasses.

I give here the following table, from Fühling's Practical Beet Grower, showing the quantities of potash, phosphoric acid, and nitrogen in a number of fertilizers:

KIND OF MANURE.	MEAN CONTENTS OF 100 POUNDS OF MANURE.		
	Nitrogen.	Potash.	Phosphoric acid.
Peruvian *guano*	15. lbs.	3. lbs.	12. lbs.
Rape cake	4.5 lbs.	1.5 lbs.	2. lbs.
Bone dust	5. lbs. (?)	....	23. lbs.
Bone dust steamed	4.5 lbs.	....	24. lbs.
Bone dust with sulphuric acid	3. lbs.	....	17. lbs.
Solid human excrement, ¼ per cent water	1. lbs.	0.5 lbs.	1.2 lbs.
Good poudrette	3. lbs.	3. lbs.	4. lbs.
Good alrat*	10. lbs.	8. lbs.	12. lbs.
Good blood manure	10. lbs.	4. lbs.	8. lbs.
Ashes, beech or oak wood	....	13. lbs. (8.4)	6. lbs. (3.5)
Flesh (according to Johnson)	5.5 lbs.	0.5 lbs.	8. lbs.
Stable manure	0.4 lbs.	0.5 lbs.	0.2 lbs. to 0.6

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* The translators have been unable to ascertain what substance is intended by the term *alrat.*

As to how much of these several fertilizers to apply to the land in order to maintain its fertility, we can only advance hypotheses, whose correctness and value are only to be established by practical experiment. The opinion that, in a sugar factory, only sugar, or a substance free from all nitrogenous and inorganic matters, is produced and taken from the beets, and that, therefore, all their nutritive material must be retained in the residue, is incorrect, since, in the refining, the steaming and boiling of the juice, ammonia constantly escapes, which we sugar manufacturers, who so frequently pride ourselves on our intelligence, do not intercept. Many salts (potash, etc.) are taken up by the bone charcoal, and these too we do not return to the soil; and, finally, part only of the residue, after extracting the juice, is made use of for manure, since it is first used as fodder. The practical rule, for each morgen of beets to feed fifteen centners more of hay to supply deficiencies in manure, may, therefore, be considered fully justified.

The following table shows: First—How much fertilizing material one hundred and fifty centners of beets remove from the soil; Second—What proportion of these is regained in the manufacture of this quantity of beets; and, Third—The loss resulting from the manufacture, which ought to be made good to the land. One hundred and fifty centners of beets, at ninety per cent of juice extracted, and ten per cent of pressed pulp, give fifteen centners of pulp, containing about four centners of dry substance, which, used as fodder, should give ($4\times1\frac{3}{4}$) seven centners of stable manure:

FERTILIZING SUBSTANCES.	Seven centners of stable dung corresponding to four centners of dry substance contain........	The scum from 150 centners of beets gives........	From the molasses from 150 centners of beets.....	Total of available fertilizing material from 150 centners beets manufactured...	Fertilizing material removed from the soil by 150 centners of beets.	Loss by manufacturing........
Potash, lbs	11.30	1.00	19.32	31.62	75.00	43.38
Carbonate of soda, lbs	1.98	....	3.14	5.12	15.30	10.18
Chloride of sodium, lbs	0.03	....	7.51	7.54	....	....
Oxide of iron, lbs	2.73	20.00	0.04	22.77	3.25	....
Lime, lbs	4.63	66.00	3.09	73.72	20.00	....
Magnesia, lbs	3.84	4.20	0.26	8.30	13.00	4.70
Phosphoric acid, lbs	8.93	4.70	0.25	13.88	23.88	10.00
Sulphuric acid, lbs	1.86	0.10	0.53	2.49	8.49	6.00
Silicic acid, lbs	62.40	1.00	0.10	63.50	15.00	....
Oxide magnesia, lbs	2.15	....	....	2.15	....	....
Nitrogen, lbs	7.00	3.60	3.00	13.60	39.00	25.40

In order to return to the soil all that has been taken from it by the beets during their growth, there must still be added, per morgen, to the residuum of the manufacture, in soluble form, at least 43.4 pounds potash, 10. pounds carbonate of soda, 4.7 pounds magnesia (?), 10. pounds phosphoric acid, 6. pounds sulphuric acid, 25.4 pounds nitrogen.

The substances here mentioned are those of which the greatest deficiency occurs, and which have usually a decided effect upon the quality and quantity of the beet crop. The foregoing statement, however, makes no claim to perfect accuracy; it gives only an approximate idea of the proportions.

PLANTING.

What we call the seed, is the immediate and most usual organ of reproduction, or plant egg, containing the germ which is the beginning of a new plant of the same species. We distinguish in it the seed-covering and the kernel.

The so-called seed of the beet consists of a capsule, or rough hull, containing from three to five separate seeds capable of germination. The seed itself contains the actual germ, and a portion of substance provided for the nourishment of the young shoot. As soon as the seed-case is sufficiently penetrated by moisture, and the shell softened so that the moisture reaches the seed itself, it begins to swell, bursts the restraining envelope, and the development of the young plant from the germ begins. By a chemical process, going on at the same time, the starch grains, etc., contained in the kernel, undergo a transformation and are made fit to serve as a store of nutriment for the young plant until it becomes able to provide for itself otherwise, by the increased growth of its rootlets. It is curious to observe how, close to the first pair of leaves, a little radicle immediately forms, which always, entirely regardless of the different positions in which the seed may happen to lie in the ground, penetrates directly down into the earth. When we examine a sprouted beet seed whose two first little leaves are just breaking through the ground, we find even then a proportionately long though delicate rootlet from one to one and a half inches in length. The root formation goes on moreover, with the greatest vigor, until, after one or two weeks, the leaf-organs also become stronger, and begin to perform their part in the further development of the plant.

The conditions under which all sound seeds germinate consist in the supply of air, moisture, and heat, and these three agents must come into operation in the right proportion, and simultaneously, if a strong and sound germ is to result; if any one of them be deficient, a perfect plant formation will not occur, but the consequence will be a more or less morbid organization.

Atmospheric air is an essential condition to the germination of any plant, and the oxygen it contains is in fact the active agent, since the seed, in the process of germination, absorbs a quantity of oxygen, and develops an equal volume of carbonic acid (Saussure). Germination, like breathing, is impossible without the oxygen of the air; since the transformation of the starch grains, contained in the seed, into soluble substances adapted to the nourishment of the young plant (gum and sugar), is, in all cases, brought about by the absorption of oxygen by the proteine substances in the seed, and although beet seeds can be made to germinate in water, it is, nevertheless, the air contained in the water which effects the result. If the water be deprived of its air by boiling, a normal germination does not take place; and in like manner, only a sickly beginning of germination occurs in vacuo, in carbonic acid, or nitrogen, etc.

Moisture is likewise a decidedly important agent, acting in the first place to distend and soften the cellular tissue and so to facilitate the rupture or bursting of the hull, and being further essential in inducing the chemical activity of the two other agents. The supply, however, must not be excessive. The seed, in the Spring, takes up one hundred per cent of water (sometimes, however, as much as one hundred and seventy per cent), and it is impossible for it to absorb more; and a greater quantity is not only useless, but may be injurious if its action be long continued. The beet seed absorbs this quantity of water in from two to three days, after which it should be put into little heaps; and only watered enough to prevent any considerable loss of moisture.

Heat, too, is a condition of germination, of which it is also a result. Germination cannot take place without sufficient heat (in the cold of Winter all seeds lie dormant in the earth, though abundantly supplied with moisture), and in like manner an increase of temperature within certain limits greatly accelerates germination and promotes the rapid development of the young plant if the necessary moisture be present. In too high a temperature, however, for instance, 40° R. and upward, the germ would dry up and perish.

As regards the influence of light, opinions differ. In germinating barley for the preparation of malt, we try carefully to exclude the light, and so in the ground the first shoot is secluded from it. Many would thence infer that light is absolutely injurious to the process of germination, which, however, is not the case, although light may at first somewhat retard germination, in so far as the higher temperature which usually accompanies it may partially dry the seed. Since, however, the seed in the ground is actually removed from the influence of light, the discussion of this question has no special interest to the practical beet grower, to whom the effect of light can only be of importance when the germ has developed into a plant and the first young leaves make their appearance above ground. Light is from this time undeniably necessary to growth, since it induces the interchange of the various gases, as well as the transposition and transformation of the various combinations continually forming in the organism of the plant. While all plants grown in the shade attain only a scanty, defective development, so beets, if grown even in partial shade, are always deficient in sugar.

If we put away ripe, air-dried seeds in a dry place, their power of germination is suspended, since moisture, one of the three conditions of their development, is wanting. The vitality of various seeds is, however, of very unequal permanence; with some, like those of the beet, it is not fully retained after two or three years, while with others, of which the mummy wheat is an example, it is maintained for thousands of years unimpaired.

From this short examination of the phenomena of germination, we pass to the sowing of the beet seed; first, however, considering the Spring tillage of the soil, which, destined for the reception of the seed, and, as it were, to be the medium for supplying all the conditions of germination and growth, exercises an essential influence on the prosperity of the crop.

Since the process of germination and the newly developed beet plants require moisture in the soil, it is the practice in many places to put the seed upon ground which has been deeply plowed in Autumn, still thoroughly moist, and which has previously been only harrowed. In this way the moisture required by the seeds and the young plants is most certainly supplied, while, on the other hand, plowing cannot be done in Spring without exposing a larger surface to the strong drying effect of the Spring winds, and thus occasioning the loss from the soil, by evaporation, of a quantity of water proportioned to the increase of surface exposed. Moreover, since the soil lying in rough Winter furrows has been subjected to the action of frost, it is in its upper layers so broken up and divided in all directions, by the powerful expansion of the water when converted into ice, as to be reduced to the condition of the greatest possible fineness, recognized and so much desired by the farmer under the term mellowness. It has consequently attained that degree of pulverization and porosity which, with an adequate supply of moisture, affords a solid standing ground for the young plants, while, at the same time, enough air for the development of the germ can penetrate the surface soil, and in the upper layers nutritive material for the young plants, dissolved by the moisture of Winter, is probably already present.

It seems therefore, quite in accordance with reason, not to plow the ground at all in the Spring (and not to allow it to be trodden by horses and oxen, who always do injury by the heavy pressure of their hoofs), but to put in the beet seed without further preparation than a previous (hand) harrowing. In Magdeburg this method has in practice produced very favorable results. It is not possible, however, to lay down any general rules as to the best method for Spring tillage; as to this, local conditions must always decide, especially the greater or less tenacity of the soil, climatic and meteorological influences, the agricultural condition of the land, the laboring force at command, etc.

If the land be somewhat foul or in a low state of cultivation, the preceding method has this inconvenience, that the weeds in the Spring shoot up very quickly and luxuriantly, and thus frequently either greatly retard the growth of the young plant, or at least entail a very thorough and a difficult, and therefore expensive first hoeing, by which all its advantages are neutralized.

If the soil be very tenacious and wet, on the one hand, insects are thus very much sheltered, and so get the upper hand and inflict serious injury—grubs, for instance, cannot be collected, as can easily be done after the plow; on the other hand, in this case, a crust is very apt to form, especially in case of rain, which impedes the access of air to the young germ leaves, and either thus chokes them or mechanically prevents their coming up. This crust must then be quickly broken up with a harrow or spike roller, but it is not to be expected that a satisfactory coming up of the plants can thus be effected in all cases.

Many farmers prefer therefore to break up and pulverize the land in Spring by means of a cultivator, without exposing too great a surface to the wind, by which it would be dried up. For this purpose also the seed harrow, as it is called, or Horsky's gang-plow, is particularly to be recommended, as it accomplishes a good deal with light draught, and turns over and pulverizes only the uppermost depth of three or four inches, according as the progress of the sowing requires.

Still heavier ground must, however, be prepared in Spring by plowing, whereby the upper portion is rendered dry and sufficiently mellow to give a suitable seed-bed. Mr. Lynes, of England, particularly recommends, for this purpose, Hancock's patent pulverizer plow, which is of extraordinary efficiency, and reduces the heaviest soil to a fine crumbly condition.

The treatment of the land in Spring depends, as has been already said, entirely on condition; light, mellow, and even mucky soils may be prepared with less outlay of time and labor than heavier ones. But, however various the views of beet growers may be on this point, that is to say, as regards the means to the end, all agree upon this, that the conditions for a favorable plant and for the future growth of the beet must be secured, namely: a deep loosening of the soil, which admits of a deep reaching, unobstructed growth of roots, and a proper degree of fineness and looseness of the surface soil, which permits the access of sufficient air and moisture to supply the requisite nutriment to the young plants. It is therefore indispensable, especially in hot climates, to let the harrow follow immediately after the implement employed for loosening the soil, and if possible to attach it to the plow or cultivator, and furthermore, to deposit the seed immediately on the freshly prepared ground, the sowing machine following immediately after the cultivator. The roller comes next, and presses the earth on the seed and levels the surface. The seed is thus put into the ground while still moist, and it is prevented from drying up. Should the ground be left unharrowed and only rolled, a very large surface, in consequence of its inequalities, would be exposed to the air, and it would dry quickly, the consequence of which would be, at the least, a very much retarded and scanty coming up of the seed.

Let us now consider what is the most favorable time for sowing.

Upon this point the most various opinions prevail among farmers. That is, indisputably, the most suitable time which effects the quickest possible coming up of the seed and insures the strong subsequent growth of the young plant. On this subject the degree of moisture in the ground is first to be considered.

Without moisture the seed cannot come up at all, but while some are anxious to retain the moisture in the upper surface soil for the seed as much as possible, others positively insist upon putting the seed in quite dry earth. The latter opinion is founded upon the fact that dry earth arranges itself better around and upon the seeds than moist lumpy earth and so immediately affords standing ground for the young roots. A dry seed bed is moreover preferable in case unprepared seed is used, which will lie without injury and without germinating until rain occurs, and then will come up uniformly; whereas, such seed in moist earth would indeed begin to germinate, but not strongly enough, and, in the case of long continued heat ensuing, would run great risk, either of stopping altogether, or of coming up stunted. If, however, the seed has been prepared, in a way which we shall just now describe, so that it will come up under all circumstances within a few days, a somewhat moist surface soil seems to me to deserve the preference, because it cannot even under the most unfavorable circumstances, dry up to such a great depth but that the little roots, which in a few days go down as much as two inches into the soil, may find, in the moisture which it still contains, the assurance of a prosperous growth. This drying up must always be confined to the surface and will be in exact proportion to the looseness of the soil. The more solid and even the surface, the less moisture evaporates, and since, under the best management, the ground is always rolled after sowing the beets, there is but little opportunity given for it to dry.

The temperature of the earth and air has also, evidently, a great influence on the moisture of the soil. Since the mean temperature of our country (Germany) is between 8° and 10° R., while the mean temperature of the soil, somewhat lower or higher, according to its mechanical condition, is usually some degrees lower, the drying up of the ground does not proceed very rapidly. According to the Gardener's Chronicle (December, eighteen hundred and forty-nine), at a temperature of above 18° R. in Summer, one fourth of the water in the top surface of the soil evaporated on the first day; on the second day the earth became dry to the depth of one tenth of an inch, and the deeper it became dry from day to day, the less was the daily evaporation, until at last, in consequence of the complete dryness of the surface, it was impossible to compute it. Plants began to suffer after eight days at a temperature of 18° R., which never occurs in Spring, at a depth of from three to four inches. With the temperature usually prevailing in Spring, the ground does not become dry to the depth of more than two inches, and, in general, dryness does not extend deeper than from four to six inches, because the moisture within certain limits seems to be sustained from below. The whole question, as to the benefit or injury of a moist soil for the seed, turns upon this: Can the beet seed be so prepared that the young root of the plant shall attain a depth of two inches, in from eight to ten days? If this be answered in the affirmative, we may safely sow upon a moist soil, provided the surface soil plows up mellow and does not become lumpy—"does not stick," as farmers commonly say. I desire to distinguish clearly between the terms *wet* and *moist*. With a soil only moist there is no cause to fear injury to the seed by long continued heat, particularly as the power of retaining water of such soils as are suitable for beet culture amounts to at least fifty per cent.

The degree of moisture of the soil depends also on the kind of land, different kinds possessing in different degrees the power of absorbing water. Dr. Schulze Fleeth found the absorbing power of different kinds of land, as opposed to the evaporation from them, to be as follows:

	Percentage of water absorbed.	Percentage of water evaporated in four hours at 18.7 deg. C.
Sharp sand	25	88.4
Coarser or calcareous sand	29	75.9
Light loam	40	52
Medium loam	50	45.7
Clay loam	61	34.9
Clay	70	31.3
Fine calcareous earth	85	28
Mucky soil (humus)	90	20.5

The evaporation thus shows plainly an inverse proportion to the absorbing power.

The time of sowing depends, therefore, in great degree, on the character of soil; a sandy or light friable soil dries more quickly and is also easier to work than a heavier one—for instance, a clay soil. In such a soil there is in dry weather frequently a bad stand, since it becomes lumpy, and the seed is not brought sufficiently into contact with the earth.

In the second place, the air contained in the soil exercises an essential influence upon the growth of the seed, since it is contained in appreciable quantity in the ground, penetrates all its interstices, and is there available to the seed.

It has been found that one quarter of the space of the cultivated surface is filled with air. A cubic foot of pulverized soil, which at least is within the reach of the beet plant, contains, therefore, one quarter of a cubic foot of air, and one morgen, plowed twelve inches deep, contains six thousand three hundred and ninety cubic feet of air. Should the soil not be in a finely pulverized condition, it will contain too much air, in which the root, whose natural position is in the ground, finds no nourishment, and starves. Moreover, the finer the soil is pulverized the better does it protect the seed from extreme changes of temperature, and by the same means is the radiation of too much heat prevented. Dr. Grouven narrates an interesting experiment (in the Journal of the Association for the Promotion of the Beet Sugar Industry, Part XCI, p. 328), which shows that the strongest and finest plants were produced when the surface of the ground was loosened to the depth of an inch (as by hoeing) every three days.

Finally, the air and the ground must contain sufficient heat for the seeds to germinate. It is, therefore, reasonable to begin the cultivation whenever the soil in Spring has attained a steady degree of heat. No other rule can be given, since the quality of the land, its position, the meteorological conditions, etc., in every locality, must control. The beet grower must carefully observe nature and learn her rules.

Count A. Bobrinsky, on his extensive estates in Southern Russia, has established the rule that beet sowing shall begin on the day on which the sum of the degrees of heat, obtained by daily noting the mean temperature of the upper layer of soil, from the time of the ground attaining a temperature above 1° R., amounts to 80° R. For this purpose a thermometer, which is buried in the ground to the depth of four werschock (seven inches), is observed every morning at six o'clock, and the reading recorded.

Figure 1 gives a graphical record of the temperature of the earth for four years. The figures at the top indicate the day of the month, those at the left the temperature of the earth, by Réaumur's scale:

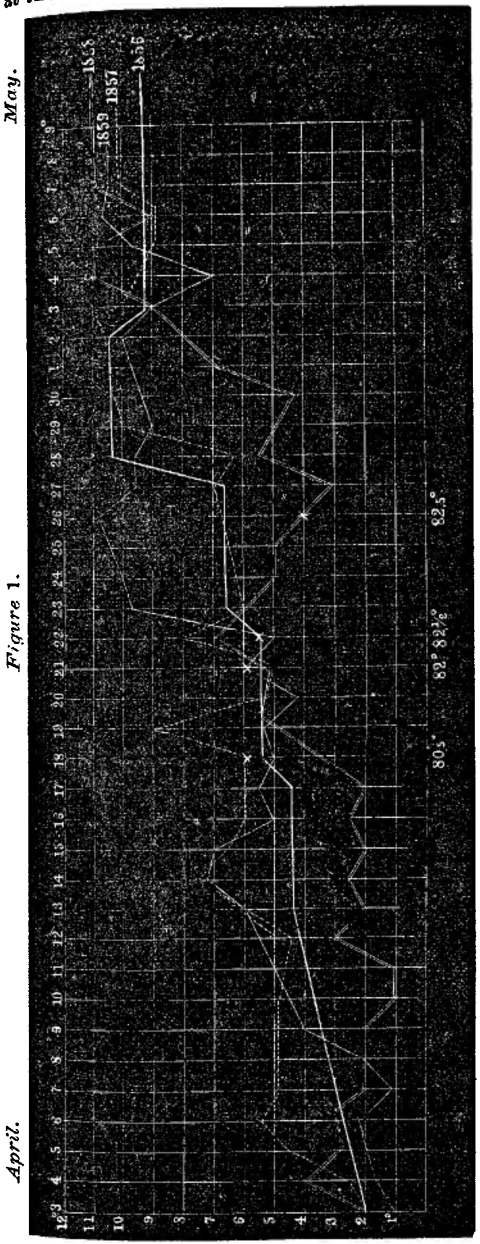

Figure 1.

It will be seen from this figure, that the cultivation had begun under the same conditions, in the years eighteen hundred and fifty-six to eighteen hundred and fifty-nine, on the twenty-second, eighteenth, twenty-sixth, and twenty-first of April. The drawing shows also an almost constant increase of the warmth of the ground after 1° R., which proves that, under all circumstances, sowing may begin by the eighteenth of April, frequently even by the fourteenth, as experience has proved. A similar course of observation ought surely to commend itself to every reflecting farmer, as likely to give efficient aid in the discovery of the laws of nature. There appear to me, however, to be in this method of ascertaining the most favorable seed time two points not sufficiently explained, namely: First, why precisely 80° of heat was taken as the rule, whereas, experience, which is here alone to decide, requires not so much the attainment of this total, but rather a constant increase of the temperature of the ground as a condition of a successful seeding; and secondly, why the thermometer is sunk seven inches in the ground. The warmth of the earth at a depth of seven inches seems to me to have very little relation to heat affecting the seed in the first days of its growth, since the seed lies only three fourths of an inch below the surface, and the young plant requires several days before its roots reach such a depth.

If the thermometer be put in the ground only two or three inches, the depth attained by the root after eight days of growth, it would be safer to begin sowing when the mean temperature has attained to about 5° or 6° R. of constant ground heat. If, however, the temperature of the soil in the morning is alone to be taken as the test, the same remarkable circumstance might then occur, which I myself actually experienced in 1861, the beet seed germinating and the plants coming up, although the temperature of the earth at 6 A. M. was 0° or even 1° below, at which no plant can grow. In this case, however, the young plant grew only under the influence of the day's heat which was imparted to the soil; during the low temperature of the night its growth stood still, until the soil was again warmed by the rising sun. It is necessary therefore to base all such observations on the mean temperature of the earth obtained in a more judicious way. The mean temperature will be ascertained if we add together the temperatures of eight o'clock in the morning, two in the afternoon, and eight in the evening, and divide the sum by three. For example, let the morning reading of the thermometer be 0° R., of the afternoon 10°, and of the evening 8°, the sum 18° divided by three gives 6° as the mean temperature of the soil which is to be taken as the test. If this mean temperature be constant, the soil will usually have attained a condition in which it may easily be plowed and cultivated. Under such circumstances tillage would begin some days earlier than the table indicates; and since early planting is not only an essential condition to the certainty of the beet crop, but also by the early growth of the young plant and its subsequent healthy development warrants the expectation of a better quality of product, earlier sowing is for these reasons strongly to be recommended, especially in dry seasons.

Heat is one of the essential conditions of germination. By the heat-giving power of the sun's rays the whole vegetable world is awakened in Spring to new life and new activity; everywhere the sap of the plant wells up and rises and pushes forth germs and leaves, buds and blossoms. Even the earth-worm is awakened from the lethargy of his Winter sleep and attracted to the surface of the ground by the magical effect of warmth. So does heat exercise a magic power over everything; and by it moisture and air, whose powers seemed before to slumber, are roused to vigorous activity. The question occurs, whether the beet grower might not be aided in his efforts, to attain quickly and in all cases a good start for his seed, by means of *artificial* heat.

We sow good beet seed in Spring, and it remains usually from ten to eleven days at a ground temperature of from 9° to 10° R. before coming up. It requires therefore in general (10×10=) 100 up to (11×10=) 110° aggregate temperature (1) to develop naturally. If we can, however, let a part of this heat, in connection with the necessary moisture, take effect on the beet seed before sowing, we may almost conclude that we can to the same extent accelerate its coming up. Beet seeds, therefore, exposed to a heat of 10° R. in the presence of moisture during five days, and then immediately sown, should come up in five days instead of ten, provided that the earth also has a temperature of 10°. Hastening the coming up of the seed is of great advantage, since the young beet plants grow quickly in advance of the weeds, and this very much lightens the labor of keeping the fields clean, since their fresh green rows show plainly on the land while still free from weeds. A similar result will be attained by keeping the seeds, moistened, for three days at a temperature of 17° R., since the time and temperature of germination are always in inverse proportion; a diminution of the time occupied in germination involves a corresponding increase of the heat supplied. It is self-evident, however, that the increase of temperature for the purpose of shortening the time of germination has its limit in practice; that we must always only supply such a measure of heat in the time required as is consistent with the conditions of plant life. The product of time and temperature must always be about 100 to 110° R., the aggregate temperature which the seed requires, conformably to the positive results of experiment, in order to the normal development of the plant; and it is likewise established, that we may safely apply one half of this aggregate temperature to the seed, out of the ground before sowing.

Having now made a few observations upon the time of sowing, we must consider the quality of the seed. Seeds, under the agencies that we have been considering, develop germs; in the germ, however, the plant is contained from the very beginning, the different kinds of cells are already formed; seeds of the same kind must therefore produce the same or similar plants. A good seed is therefore necessary, in order to produce a good sugar beet. The seed of a turnip reproduces a turnip plant; in the seed of a fodder beet is contained the embryo of a plant, which will yield but little sugar; and so the seed of a beet, itself rich in sugar, will transmit the properties of the parent plant, and special care should therefore be given by sugar manufacturers, to obtaining seeds from beets abounding in sugar, although many will not acknowledge the fact of such hereditary transmission.

To those sugar manufacturers who deny this fact, I would remark, that very many kinds of beets evidently exist, every one of which has retained its characteristic properties for centuries. The fodder beet is always but slightly saccharine, even upon the best sugar beet soil. The apple furnishes a convincing proof of the wide differences that may occur in the varieties of the same species of plant reproduced by seed, for its juice usually contains from ten to eleven per cent of sugar, and yet one variety in the same climate may contain from sixteen to eighteen per cent, an amount thus about fifty per cent higher; and yet it is still an apple.

In this, I by no means desire to maintain that the selection of a good seed will, under all circumstances, insure a good sugary beet, since this indeed depends chiefly upon the condition of the soil, the manuring, the course of cropping, and the influence of climate; but I consider it important to commend the point to closer attention, since I believe it necessarily to result, from comparative trials directed to this question and extending over many years, that the best seed always produces the best beets. Extensive experiments have indeed shown me that bad beets may be produced even from good seed, if the soil and the manure be not adapted to sugar beets, and that indifferent seed may produce better beets from a better soil. From this it has been sought to draw the conclusion that the seed has little or no influence on the quality of the beets produced, but in my opinion such an inference is entirely incorrect, because the conditions were not the same, and that all that can fairly be held to follow is that the land, or its chemical and physical condition, together with the manure, are the most influential agents; and that even the best varieties may degenerate under adverse influences.

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(1) The term aggregate temperature (Warmemengen) indicates the product of heat and time = degrees of the thermometer x days.

Let, then, each manufacturer, to whom it is of importance to determine the influence of his soil upon the different varieties of beets, make the experiment with different kinds of seed in the same field, deposit the seed on the same day, at the same depth, cultivate precisely alike, and at harvest make an accurate examination of fifty beets of equal size of each variety, so as to obtain a mean average result from which to decide as to the best variety for his locality. This is a simple, practical way to accomplish the desired result without expense.

I may further remark that the manufacturer has to test the vitality of the seed in deciding as to its quality. Two-year-old seed, for example, germinates much more slowly than that only one year old; and if we should have a mixture of the two, the consequence would be that the seed would come up very unequally. By trying a few seeds it may easily be determined.

The size of the seed seems, also, to be not without influence; the bigger the seed the stronger the young plant. Seed which has not attained its full development is not likely to produce perfect plants. This is the case with all vegetables; and in the animal kingdom, also, the parents transmit their characteristics to their offspring.

The so-called seed of the beet has a peculiar rough appearance, and consists of a shell, or thick capsule, in which are contained several (from three to five) little separate kernels covered with a brown skin; and from each of which a plant is developed. Nature appears, therefore, to have provided that, in all cases, at least one beet shall spring up whenever one of these seed capsules falls into the ground. As soon as the seed germinates, a scale comes off from the capsule, and permits the root to penetrate into the earth, as well as the leaf germ to grow upward, in doing which it frequently, if very lightly covered, raises the shell with it from the earth. We sometimes supply the requisites for germination to the seed in Spring, before putting it into the ground, in order to induce its coming up more quickly and certainly. We supply to the seed the necessary moisture and heat by soaking it in water, or by moistening it with water, at a temperature of 10° to 15° R. It is evident that the seed requires this moisture, for it takes up the equivalent of its own weight of water (that is, one hundred per cent, sometimes, indeed, over one hundred and seventy per cent.) We can even effect, in this way, supplying also the requisite heat, the complete germination of the seed, without putting it in earth. Soaking in plain water entails, however, certain disadvantages. If we examine the water in which the seed is soaked, we find that it soon becomes brown; the water has, therefore, dissolved some substances from the seed—has actually macerated it. If we pour off this brown water and let it stand exposed to heat, it soon gives off the smell of ammonia, proving that the water has soaked out nitrogenous matter, which nature has evidently stored in the seed for the nourishment of the young germ. This seems to prove at least its being easily soluble. The young plant will, moreover, be correspondingly weaker, and of a paler color, from seed that has been soaked in water; and the longer the action of the water has continued, the more evidently will this be the case. After soaking three or four days the difference is plainly seen. I know of many experiments where almost an entire failure of growth was brought about by repeated soaking of the seed, and consequent extraction of its nitrogenous matter. There is, also, another objection, from the fact that seeds soaked in water very quickly dry, and the evaporation of the water leaves them even dryer than before. Such seeds, therefore, frequently perish in dry soil or in a continuance of warm weather.

The evils which ensue from soaking in pure water may easily be avoided by moistening the seed with liquid manure or urine. Liquid manure, in consequence of the quantity of salts which it contains, can dissolve but little from the seed, but, on the contrary, completely impregnates it with its fertilizing material, so that the young plants from seeds so treated appear decidedly stronger and darker in color. Moreover, the seed is not rendered liable to dry up by this steep, but, in consequence of the hygroscopic properties of the saline substances which it contains, always continues moist. Experience seems, therefore, to show that soaking for two or three days, at 16° R., best promotes the coming up of the seed. In experiments, seeds soaked two and three days came up, under unfavorable conditions, on the seventh day, while those soaked four, five, and six days did not come up until the eighth and ninth day.

The objection has been made to this plan of soaking, that it is unnatural. To those who are inclined to maintain this opinion, I will only suggest that the beet seed upon the plant becomes ripe in Autumn, and in its natural state, growing wild, then falls off, and, lying in the ground during the Winter, takes up the necessary moisture to enable it to grow strongly in the Spring. Nature shows this on the beet seed field that has been left to itself. On the contrary, what do we do? We gather the seed and lay it up in a dry place until Spring. It is evident it must become dry, and I ask, therefore, is it unnatural to supply to the seed the moisture of which it has been deprived? The only question, then, is as to the choice of the medium by which it is to be moistened, and the liquid manure is to be recommended because it is the most suitable which the farmer has at command, and in my experiments, proved superior to all artificial preparations.

In Dr. Grouven's experiments, in eighteen hundred and fifty-seven, the best results were obtained by a use of the following, out of a large number of materials:

Guano (used for drying the seeds after soaking in water).

Nitric acid (1 part in 100 of water).

Strong liquid manure, especially by the use of saltpeter, for coating the seed after soaking.

In eighteen hundred and sixty, I experimented, with the following results:

Urine and water equal parts. One hundred per cent germinated. Seven days after sowing, the plants were stronger and darker colored than those steeped in water.

Solution of phosphoric acid and ammonia of a strength of 2° Beaumé. Seventy-one per cent came up in seven days.

Nitric acid (1 part to 100 of water). Twenty-five per cent came up, weaker, in nine days.

Saltpeter solution (5 to 100). Eighty-five per cent came up, stronger, in seven days.

I would, however, further observe, that the seed in the saline solutions employed sank on the third day, while those in pure water continued to float—a plain proof that they had in this time absorbed a large portion of the specifically heavier salts.

The quantity of moisture which the seed absorbs depends also on the temperature. Haberlandt states that the seed, after twenty-four hours steeping, absorbed water as follows:

At 3.76° R.	69 per cent.
At 8.36° R.	91 per cent.
At 12.49° R.	95 per cent.
At 14.08° R.	97 per cent.

Coating the seed steeped in manure water may prove beneficial if substances are employed which are not too powerful, and, therefore, injurious to germination. Saltpeter gives good results; and pulverized lime has also proved beneficial, especially in destroying insects.

I sowed, on May sixteenth, six seed grains which had been steeped twenty-four hours in urine, and then coated with charcoal dust; and the same number similarly steeped, but not dried with charcoal dust. From the former, on May twenty-first, nine plants had come up; on the twenty-second, thirteen; and, on the twenty-third, two more, making fifteen in all. From the latter there were, on the twenty-first, five plants; on the twenty-second, eight; on the twenty-third, thirteen. It thence follows that the seed kernels treated with charcoal dust produced more and stronger plants than without. That fifteen plants should be produced from six kernels (planted one fourth inch deep) is in consequence of the size of the capsules. A large seed capsule may produce five plants; only a single plant sprouts from a very small one.

That manuring the seed by means of steeping effects a decidedly quicker and stronger growth of the young plant in the first fourteen days is certain, and easily to be proved by experiments. The advantage thus gained is not inconsiderable. The young plant quickly outgrows dangers from insects, and, at the very beginning, lays a sure foundation for its subsequent growth. since its organs for absorbing nutriment develop earlier and stronger. Its infancy is the critical period; if the young beet plant once passes that, the battle is half won. The most advantageous method in practice is, therefore, to steep the seed one or two days in manure water; then to keep them moistened for two or three days in thin layers, four inches deep, in bags for instance, so that an aggregate temperature of 50° R., by exposure for five days at a temperature of 10°, or four days at a temperature of 12°, may be attained without heating. How important such treatment is for effecting the quick as well as certain germination of the seed, is proved by a comparative trial which I made in eighteen hundred and sixty, in which I planted, on the twelfth of April, seeds which were unprepared, and on the eighteenth seeds treated according to the above directions, otherwise under precisely the same conditions, side by side, in the field. The unprepared seed came up May second; the prepared seed as soon as April twenty-sixth. There were thus twelve days gained for the growth of the plant by this treatment of the seed. If rainy weather should prevent sowing, the prepared seed may be kept without injury as long as desired in cold water (cooled with ice). The practical inconveniences are, therefore, not insurmountable.

Especial care is to be taken that the seeds, after having been steeped, and while lying in small heaps, do not become heated, since this elevation of temperature would impair its vitality. Instead of steeping, it is frequently preferred to spread the seeds in thin layers, and to sprinkle or water them, in order to induce a more gradual, natural effect on the embryo. In this case, also, the temperature must not rise too high. The sprinkling may then be frequently repeated or continued during several days.

Whichever of these methods the manufacturer prefers, at all events the long continued practice of many other countries sets the example of a similar preparation of the seed. Humboldt, for instance (Travels in Equatorial Regions, vol. 2, p. 234), states "that in America they leave the seeds of the coffee tree, or the bean with part of the pulp still adhering, to germinate in heaps between banana leaves for a space of five days, and do not plant the seeds until germinated. Plants reared in this way will stand the heat of the sun better than those grown by planting in the ordinary way."

The pulp, the berry, and the banana leaves are here evidently to be considered as a source of fertilizing material, which, under this treatment, promotes a more vigorous growth. The seeds of the Chinese sugar cane (*sorghum saccharatum*) are also steeped twenty-four hours in water to advantage before planting. (Navara, Travels Around the World).

It would seem, then, that more importance should be assigned to seed manuring than has been, commonly, hitherto. Seed manuring supplies directly to the young plant the nutritive substances which it requires for its vigorous development, at the time it is just beginning to grow and while its organs are yet unfit to seek its nutriment over a wide range of soil. The vigorous development of the plant while young is, moreover, a sure guaranty of its full perfection and ripening, and it is for this reason I specially refer to it. An experiment which I made, of covering with charcoal powder seeds that had been steeped in manure water, gave very surprising results. It is known that charcoal has the property of accumulating a large quantity of ammonia in its pores, and can thus furnish an abundant supply of nutriment to young plants. It is possible, however, that other substances may prove still better; and it remains a task for the agricultural experimental stations to determine which is the best fertilizer for this purpose, and to publish the result. In order to cause a larger quantity of fertilizing material to adhere to the seeds, there might be a kind of fluid mucilage made from potatoes, the seed kernels sprinkled with it, and then shoveled over with fertilizing substances. At all events, the idea of seed manuring, as applied to beet seeds, seems to me not yet to have been sufficiently tested, and these observations are designed to call attention to it.

Having now considered how the seed may best be prepared, let us inquire as to the necessary quantity for sowing a given area.

A Prussian morgen, (¹) according to its quality, is set with beet plants at distances of from twelve to eighteen inches each way. There are, therefore, on one morgen:

At	12	inches	apart	= 144	square	inches	to a	plant,	25,560	plants.
	13	"	"	= 169	"	"	"	"	21,780	"
	14	"	"	= 196	"	"	"	"	18,000	"
	15	"	"	= 225	"	"	"	"	16,560	"
	16	"	"	= 256	"	"	"	"	14,580	"
	17	"	"	= 289	"	"	"	"	12,960	"
	18	"	"	= 324	"	"	"	"	11,520	"

(¹) The morgen, as will be seen from the context, = 25,560 square feet, and the Prussian foot being 1.02972 feet English (or squared = about 1.06) makes one morgen = .6219 of an English acre. For purposes of comparison, it may therefore be called five eighths of an acre, or eight morgen = five acres.—*Trans.*

If we take even the largest number, that is, 25,560 plants per morgen, it will require a corresponding number of seeds, capable of producing two to four plants each. And since it takes fifteen to sixteen thousand seeds to weigh a pound, we should require, at the most, two pounds, if the theoretical quantity would suffice.

In practice, we take ten pounds of seed to the morgen, or about one hundred and fifty thousand grains, which, at only two plants to each seed, would give three hundred thousand plants, which, at twelve inches apart, is ten times more than theoretically necessary, and at sixteen inches apart, as much as twenty times more.

The reason for using so much seed is, briefly, that part of the seeds have lost their vitality, and part are not planted at a proper depth in the ground; a point of great importance, which we shall consider hereafter.

The seed also frequently suffers, as well as the tender, sweet plant germs, from insects in the ground; for we find the fewest plants in those cases in which the seed comes up late, having been retarded by unfavorable weather, and the largest number when the seed is most quickly developed into a vigorous plant.

In France they steep the seed on this account, in the oil of the *camelina sativa* (gold of pleasure), the smell of which protects the seed as well as the plants from the ravages of insects. (Cosmos, part 25, page 685.)

The greatest reason for the employment of so large a quantity of seed in practice, is however, that by sowing thickly in clusters, there not only seems to be a strong growth, but it gives also such an immense quantity of seeds and young plants for insects to prey upon, as even these greedy creatures are not able to devour entirely; whereas, if we sow more sparingly, many missed places in the field may be expected.

Although it would accordingly seem, as far as now known, to be the best economy to waste the beet seed to a certain extent, still this does not prevent attempting to attain the same results by simpler means. There is here certainly sufficient employment for a calculating mind.

The time required for the germination of the seed bears, as has been before remarked, an inverse proportion to the temperature; it is shorter in higher, longer in lower temperatures. But an exact proportion between these two factors never appears in practice, since the product of time and degrees of mean temperature, the *aggregate temperature* required for germination, is a very variable number. For example, according to Friedrich Haberlandt, at a mean temperature of 3°.76 R., beet seed germinated in twenty-two days; whereas, germination was equally advanced at 8°.36, in nine days, at 12°.49, in three and three quarter days, and at 14°.80, in three and three quarter days; from which are obtained aggregate temperatures, differing very much in amount, viz: 82°.72, 75°.24, 46°.8, and 55°.8, respectively.

We have remarked that the unequal depth at which the beet seeds are deposited in the earth, greatly affects their coming up, and that we are, in consequence, compelled to use an excessive quantity of seed. The many missed places in the field, amounting to from five to thirty per cent of the whole, appear very frequently to have been occasioned by the too deep deposit of the seed. The following examples furnish a key to the determination of the most proper depth for sowing:

On the 23d of March, 1860, at 2 P. M., at a temperature of 12° R., twenty beet seeds were planted at each of the depths stated in the following table:

DATE.	NUMBER OF PLANTS THAT HAD COME UP AT THE SEVERAL DATES, FROM TWENTY SEEDS PLANTED, AT EACH OF THE DEPTHS STATED.				
	¼ inch.	½ inch.	¾ inch.	1 inch.	1½ inch.
March 31	....	6	10	7	....
April 1	....	13	17	17	2
" 2	1	26	30	30	8
" 3	1	32	40	37	16
" 4	3	40	44	41	19
" 5	14	50	47	45	24
" 6	39	62	49	54	30
" 7	51	69	54	56	32
" 8	52	71	57	56	37
" 9	53	71	57	57	40
" 10	53	71	57	60	42

REMARK.—The plants from the ¼ inch sowing, were very small, and those from 1½ inch, poor and sickly. The plants from the ½ inch sowing, were the finest and strongest. Those from ¾ and 1 inch, were nearly as fine.

Dr. Grouven made, in eighteen hundred and sixty-two, the following experiments on the depth of sowing, which entirely agree with my previous experiments, and prove that from the same quantity of beet seed, the more numerous and stronger plants will be produced, the less the depth at which the seed is deposited in the earth.

DEPTH OF SOWING.	No. of days to the appearance of the first plant.	NUMBER OF PLANTS THAT HAD COME UP—		
		In 8 days.	In 12 days.	In 16 days.
1 Centimetre	5	19	23	24
2 Centimetre	5⅓	14	20	21
3 Centimetre	5½	15	22	23
4 Centimetre	6½	15	16	17
5 Centimetre	6¾	8	17	18
7 Centimetre	8⅔	4	12	14
9 Centimetre	10	1	5	7

From the first table it appears that from one grain of seed there were produced from—

The depth of one quarter of an inch	2.65 plants.
The depth of one half an inch	3.55 plants.
The depth of three quarters of an inch	2.86 plants.
The depth of one inch	3. plants.
The depth of one inch and a half	2.10 plants.

From Dr. Grouven's experiments, that one grain of seed planted—

1 centimetre deep produced	3 plants.
5 centimetre deep produced	2 plants.
8 centimetre deep produced	1 plant.

The plants from the depth of one to three centimetres (= ⅝ to 1⅛ inches) were always the most vigorous. (1)

The decidedly most proper depth is, therefore, between one half and one inch, although in exceptional cases the condition of the soil may slightly alter the result.

At the same time I would observe that the seed should not be sown too shallow; since the different smaller seed kernels, of which one beet seed incloses from three to five, do not germinate at the same time. If only one of them germinates and pushes its root into the earth, the opposite end then, on its side, rises as a result of a development of the leaf, and, if it be too lightly covered, lifts the whole seed vessel out of the ground; and in this case the other seeds, in the remaining cavities of the same seed vessel, are naturally prevented from germinating, or, at least, from developing any more plants.

Upon a close examination of my table (in which the different figures are the uniform results of several experiments), it will be seen that the individual plants come up at very different times; and it is, therefore, strictly speaking, difficult to specify exactly the time of the general coming up of the seed. If we agree to call the time of coming up of the seed, that at which as many plants have come up as seeds were sown, the seeds then required to bring them up—

If sown ¼ inch deep, 13 days or (13 × 12) 156° aggregate temperature.
If sown ½ inch deep, 9 days or (9 × 12) 108° aggregate temperature.
If sown 3 inches deep, 9 days or (9 × 12) 108° aggregate temperature.
If sown 1 inch deep, 9 days or (9 × 12) 108° aggregate temperature.
If sown 1½ inches deep, 12 days or (12 × 12) 144° aggregate temperature.

In Stevens' experiment there came up from forty seeds (rutabagas), at a temperature of 19° R.:

Planted one inch deep, thirty-one plants = to 77 per cent, after four days and twelve hours = 85°.5 aggregate temperature.

Planted two inches deep, twenty-nine plants = 72 per cent, after five days and eighteen hours = 108°.3 aggregate temperature.

Planted three inches deep, twenty plants = 50 per cent, after six days and twenty-one hours = 130° aggregate temperature.

Planted four inches deep, ten plants = 25 per cent, after eight days and eighteen hours = 150° aggregate temperature.

The quicker or more protracted vegetation of beet seed appears to me, therefore, very evidently to depend upon the depth, so that, in case of depositing the seed too deep, it may not attain sufficient strength to break through the earth. Therefore, when Stevens states that the power developed in the germination of a single seed is sufficient to lift two hundred pounds, it seems to me, as regards beet seed, to be a little exaggerated. A layer of earth four inches thick and one foot square weighs less than twenty pounds, and therefore a crust formed upon stiff soil by heavy rain ought to be quite easily broken through just in one place by a force of only twenty pounds, which, however, the germinating seed cannot accomplish, although the soil contains a large quantity of air (one quarter of its bulk) to support the germ a sufficient length of time. Let us, as practical men, not rely too much upon such fabulous powers.

As has already been said, a uniform depth of about three quarters of an inch is the most favorable for the quick coming up of the seed, and in consequence of this experience the uniform depth of machine sowing has the preference over hand sowing, in which the seed is always put in at unequal depth.

Under existing circumstances the farmer can only count upon seventy to ninety per cent, according to his care in sowing, the weather, etc., of the plant places that shall actually produce beets, a circumstance which diminishes the yield from ten to thirty per cent.

The quantity of beets that a soil can produce depends, of course, upon its strength. A strong soil can support a larger number of plants than one which possesses less assimilable plant food. Since, however, the sugar manufacturer, as a matter of choice, should try to avoid large sized beets, which always contain a smaller percentage of sugar, it would seem reasonable to plant more closely upon a rich soil. We therefore give one hundred to three hundred square inches to each plant, according to the quality of the soil. It is not, however, to be expected that a corresponding increase of weight will result from increasing the space allotted to each beet, for the beet, not having long, fibrous roots, must obtain its food within a limited space. The beet is a plant which goes deeply into the ground (I have traced the roots as much as four feet, at which depth they entered drain pipes), and feeds within a narrow circle, though at a considerable depth. The nutritive fluids contained in the soil may indeed pass from the more remote to the immediate neighborhood of the beet, so as to be of benefit when this circle has become more or less exhausted of them; but the beet is nevertheless not capable of utilizing the whole horizontal space assigned to it. If it could do so, it would follow that a beet, having, for instance, three hundred square inches of soil to draw upon, must necessarily become three times as large as one occupying only one hundred square inches of soil of the same quality. In proof that the weight of the beet does not increase in proportion to the area of soil available, I give the result of nine experiments:

Number of experiments.	Space occupied by each plant in square inches.	Average weight of plants in pounds.
3	100	9.67
3	200	0.73
3	300	0.96

Hence, it appears quite evident that the size of the beets did increase with the increase of the area which they were allowed to occupy; but the increase of the average weight was under fifty per cent, whereas the increase of the area was two hundred per cent. It thus appears to be decidedly unprofitable to the beet-growing sugar manufacturer to increase the spaces between the beets above thirteen or fourteen inches each way. I may mention, as one out of many practical results, that an experienced and ingenious manager (Mr. Bronsch, of Balakleja), increased the plant spaces on his land about one fifth, or twenty per cent, and in this way obtained decidedly larger returns; a result which is in strict accordance with theory. Of course, more is removed from the soil by a larger crop, and what is thus consumed must be returned to the land; but the soil is made to yield an increased return, to accomplish which is the most important and primary object of scientific agriculture; and the chief aim of the beet grower, which is to produce as many and as good beets as possible from the smallest area, is thus attained. If the manufacturer have too many beets, which, however, can but seldom be the case, he may cultivate less land, and so diminish the cost of production; but if he have not beets enough for his factory, increasing the spaces between the plants renders it possible to produce more.

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(1) Journal of the Beet Sugar Industry, No. 91, p. 331.

The manner of disposing the plants upon the surface appears to be of much less importance than the space allotted to the beet for its support.

Beets are planted either in squares (rectangular parallelograms), fig. 2, or in rhomboids (oblique-angled parallelograms), fig. 3, or in rows, fig. 4. The rectangular form considerably diminishes the labor of supervision and arrangement. The rhomboidal has the same advantage, but utilizes the area decidedly better, since in the rhomboidal method of sowing, while each beet stands as far from the next as in the rectangular, there are, as is evident from the accompanying figure, more beets on the same extent of ground. If we assume that the beet draws for its nutriment upon the surrounding soil in all directions equally, consequently that it is restricted to a circle as its feeding range, then the spaces, *a*, *a*, intervening between these circles, are to be considered as unutilized; and it follows that these unused spaces, *a*, *a*, are much larger in the rectangular (fig. 2) arrangement then in the rhomboidal (fig. 3). Achard, even in his day, advised planting in this way; and it is now the rather to be recommended, since we have been enabled to accomplish this arrangement in planting, by which we obtain more plants from the same ground without incurring additional expense, by the use of machines, if only care is taken at the beginning of each new row.

Fig. 2.

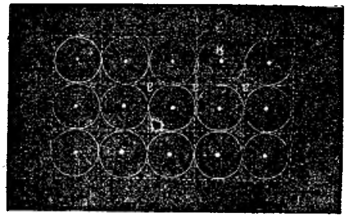


Fig. 3.

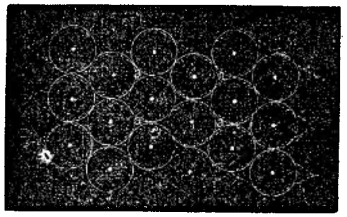
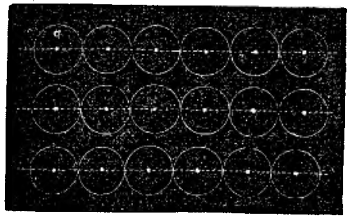


Fig. 4.



The method of planting in rows must frequently be adopted in districts where the supply of labor is deficient, or where the extent of the crop renders cultivation by horse power, and, consequently, planting in rows, a matter of necessity.

It would seem that planting in rhombs must give the largest yield. A few experiments, however, on a small scale (which of course cannot be conclusive), gave the following results, which I append for comparison.

I repeat, no exact conclusion can be drawn from these experiments; the rhomboidal arrangement, however, has certainly much in its favor:

At one hundred square inches to each plant.

MANNER OF ARRANGEMENT.	NO. OF PLANTS.			WEIGHT.			PERCENTAGE OF SUGAR.			
	There should have been....	There were actually........	Per cent of spaces occupied...	Of the beets....	Of the leaves....	Proportion of leaves to roots.	By Balling's saccharometer.	By the polarization process...	Quotient.........	
I	52	39	75	27	22	85	12.9	8.95	69	Squares.
II	63	49	77.7	26	17	65.4	13.5	10.10	75	Rhombs.
III	63	38	60	31	22	70	12.8	8.80	68	Rows 16 x 6.3 inches.
Average	178	126	70.8	84	61	72.6	13	9.25	71	1 plant=0.67 pounds.

At two hundred square inches to each plant.

I	30	23	70.6	12	10	83	12.9	9.8	76	Squares.
II	36	27	75	22	15	70	12.	8.4	70	Rhombs.
III.............	32	31	96.5	25	20	80	12.35	9.3	75.3	Rows 16x12.2 inches.
Average	98	81	82.6	59	45	77.7	12.4	9.17	74	1 plant=0.73 pounds.

At three hundred square inches to each plant.

I	19	18	94	15	15	100	12.4	8.7	70	Squares.
II	24	24	100	20	15	75	12.1	8.34	69	Rhombs.
III.............	18	15	83	20	13	65	12.3	8.61	70	Rows 16x20.3 inches.
Average	61	57	93.4	55	43	78	12.3	8.55	69.3	1 plant=0.96 pounds.

Whatever arrangement be adopted, it is always of great importance that the beets stand in straight rows, since these assist the view and promote thoroughness in working.

Different means are employed for depositing the seed in the ground. Some prefer sowing by hand, others the employment of machines.

In Magdeburg, sowing by hand is preferred. There are there, however, many circumstances which favor it; small, ill divided fields, on which machines cannot work to the best advantage; an intelligent class of laborers, who are perfectly familiar with the work, and perform it well and cheaply; and, finally, hand sowing receives the preference from long custom. There are two ways of proceeding. In the first the ground is marked; that is, lines are drawn with the marker, or a slatted roller, over the field, crossing each other at right or acute angles, the points of intersection indicating the places for the seeds. In the other method, two parallel cords are stretched, the knots in which mark the distance apart for the beets; between these two parallel lines another cord is stretched at right angles, and is also knotted at regular distances; at the places thus indicated, the laborer, after making a depression with a trowel or hoe, deposits in it five or six seeds by means of a little spoon, then covers with earth and presses down. Upon the coming up of the seed, strong clusters of young beets stand out in handsome, regular squares. This mode of sowing, to distinguish it from the sowing in rows, is called "clusterwise sowing," and has this in its favor, that the beet seeds, when many together, come up more quickly, since heat is developed during germination, which promotes a quicker growth, and that these little clusters of young plants endure night frosts that may occur better than those sown in rows, and afford such an abundant repast to the insects that some sound grains of seed always remain, which consequently preserves the crop, or at least makes it more sure. It is, moreover, quite an important consideration that the exact place is indicated to the laborer, at which he is to leave a beet standing at the time of singling; whereas, sowing in rows gives an opportunity for all kinds of slovenliness. A quicker germination and growth of the young plants is undeniable; on the other hand, the little root fibers twine about each other, and they often suffer more in thinning than beets standing singly in rows.

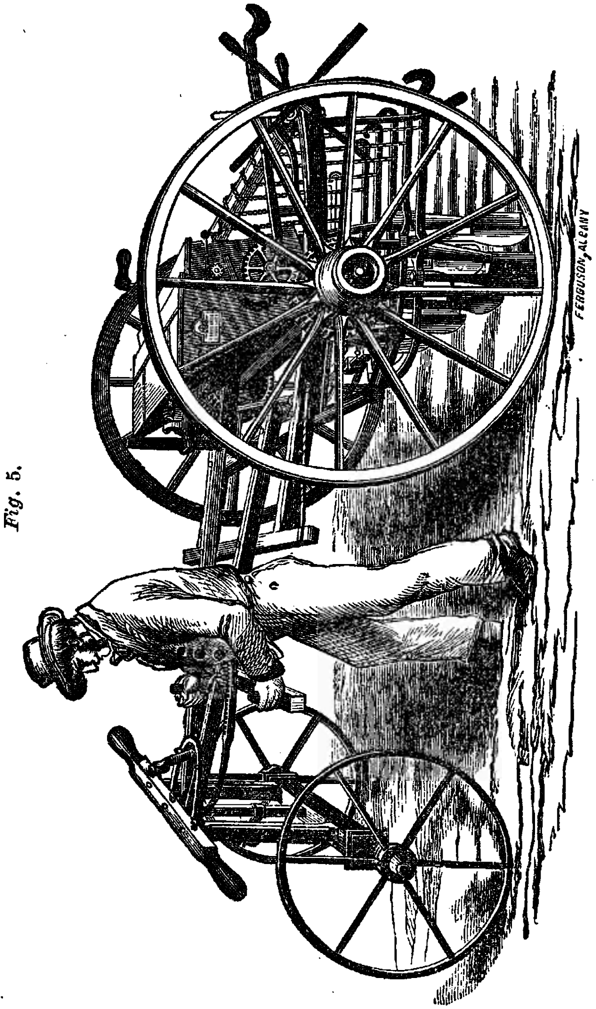


Fig. 5.

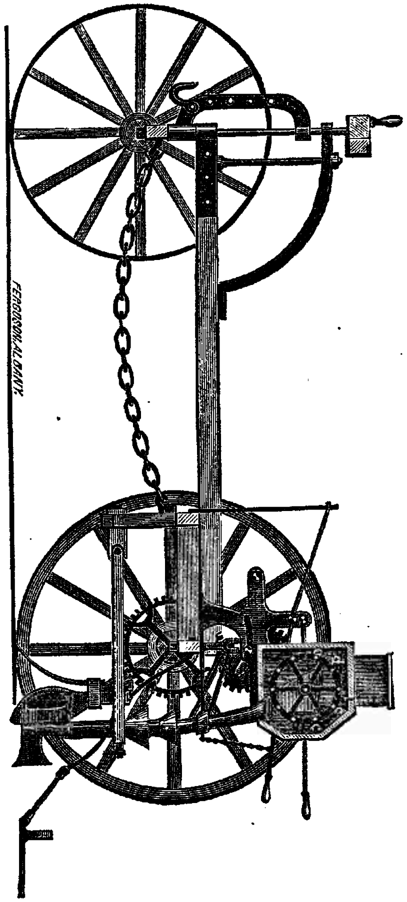


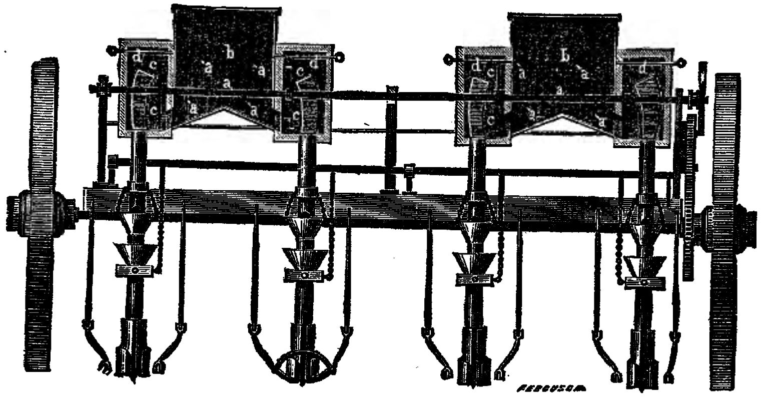
Fig. 6.

The sowing machines offer all the advantages in sowing that have been mentioned, and these are so many that the disadvantages which always attend the use of them appear inconsiderable. Above all, machine sowing affords the great advantage that the seeds are all placed at the same depth, whereas, in hand sowing, more or less variation is inevitable. We have already seen how important the uniform depth of the seed in the ground is. Since, then, machine sowing is in addition decidedly cheaper, no intelligent person can be in favor of hand sowing. Regarding the sugar manufacture the world over, we find machine sowing very decidedly more prevalent. In Austria, Prussia, France, and Hungary it is for the most part adopted, and is absolutely necessary wherever extensive areas require quick preparation. The objection that machines cannot be used on all ground is an exaggerated one, or at least ill considered. With the present perfection of beet sowing machines, it is possible to sow up and down considerable hills without missing, and when the ground is too difficult, then it is not in general of particular advantage to establish extensive beet-sugar factories. The thing looks worse than it is. Only begin; try it with determination and it will succeed.

As machines adapted for the cluster sowing, those of Sack, of Löben, and of Kutzer, of Dürnkrut, are to be recommended.

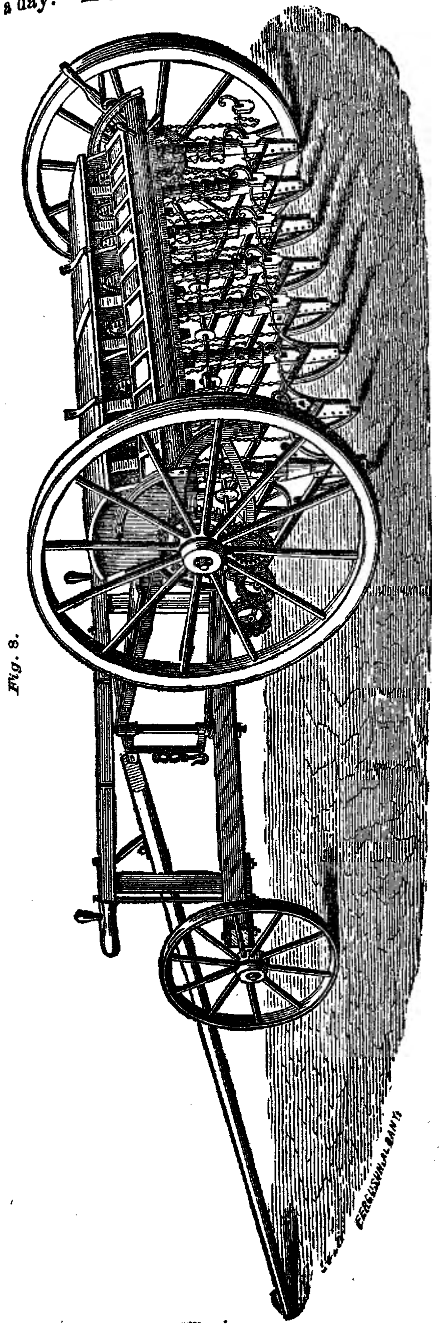
For sowing in rows, the well known Garrett or Hornsby drill is best adapted. Figure 5 shows one of these machines, complete, and with Hornsby's peculiar steering apparatus. It will be understood without special explanation. This machine is now altered by Count A. Bobrinsky for beet culture, so that wet or moist seed can be sown with it, which is sometimes of essential benefit. His arrangement (figures 6 and 7) consists of a shaft, *a*, which goes through the seed boxes, *b b*, and, in turning, carries the little pins, *à à*, around with it, by which the seed is kept constantly in motion and pushed forward, so that the scoop, *c*, must necessarily take it up. Further, in order to cause the moist seed to fall out of the scoops, pins, *d d*, are placed, supported at one end in a seat, and so as to fall upon the scoops as they revolve with the other part of the machinery. A counterpoise on the outside so increases the force of the blow that the wet seed always falls out of the scoops; the seeds caught by the scoops then fall through the movable conductors down into the seed drills, opened to the depth of three fourths of an inch, and are immediately covered with earth by the drag.

Fig. 7.



The newest construction of sowing machines is that made by Siedersleben, at Bernburg on the Saale, under the name of the "Germania Dibble Machine." The accompanying figure (figure 8) is a view of it; and it will be seen at once, without particular description of the parts, that it sows eight rows at a time, and thus possesses very considerable capacity of work, estimated at thirty-five to forty morgens a day. A further merit of this machine is that it dibbles; that is, puts the beet seeds in clusters at exact distances. In this way the beets not only come up quicker, but singling is greatly facilitated by the exactness of the spaces. This machine has particular advantages; especially that it can be used for grain of all kinds, which, with others, as Bobrinsky's, for instance, is not the case.

Fig. 8.



Another kind of sowing machine, which sows in clusters, is that designed by Mr. Kutzer, of Dürnkrut, with regard to the efficiency of which there are many favorable testimonials. This machine appears to me to be very worthy of approval, since it possesses the advantages of hand sowing, depositing the seed in clusters, at exact distances, without having the disadvantages of unevenness of depth, etc.

It is represented in the accompanying drawing (figure 9). The parts marked *a* are iron wheels, which have recesses at even distances, which, as they turn, receive the desired quantity of seed from *b*, and, turning further, let it fall into the ground. The irons, *c*, are for the purpose of covering the seed, and can be easily raised by *d*. Through *e* and *f*, the wheels *a* receive motion from the wheel *g*; *h* is the easily swaying fore wheels, by which the machine is guided.

With whatever machine the sowing may have been done, it is always essential to roll afterward, as soon as the ground is suitably dry (usually on the next day). The upper layer of soil is thus made finer, and, consequently, lies better about the seed (which essentially contributes to their favorable coming up and growth), and presents a perfectly smooth surface, the advantages of which are sufficiently evident to every reflecting and careful farmer, since it insures the distribution of the seeds and their coming up properly separated. The rollers behind the sowing machine are, therefore, to be discarded and replaced by a separate roller, since it is then not necessary to delay sowing until the ground is perfectly dry; and, in addition, the seed, by the subsequent rolling, is brought into more perfect contact with the dry, pulverized soil. The roller in three parts, the position of which in relation to each other is shown in figure 10, is especially to be recommended for this purpose. Two separate rollers go in front, and a single one follows in such a way as to be exactly in the middle of the two preceding ones. A roller so constructed leaves no strip of earth untouched, adapts itself, in consequence of the shortness of the cylinders, very easily to the inequalities of the ground, and, therefore, works more perfectly than a long roller.

Fig. 9.

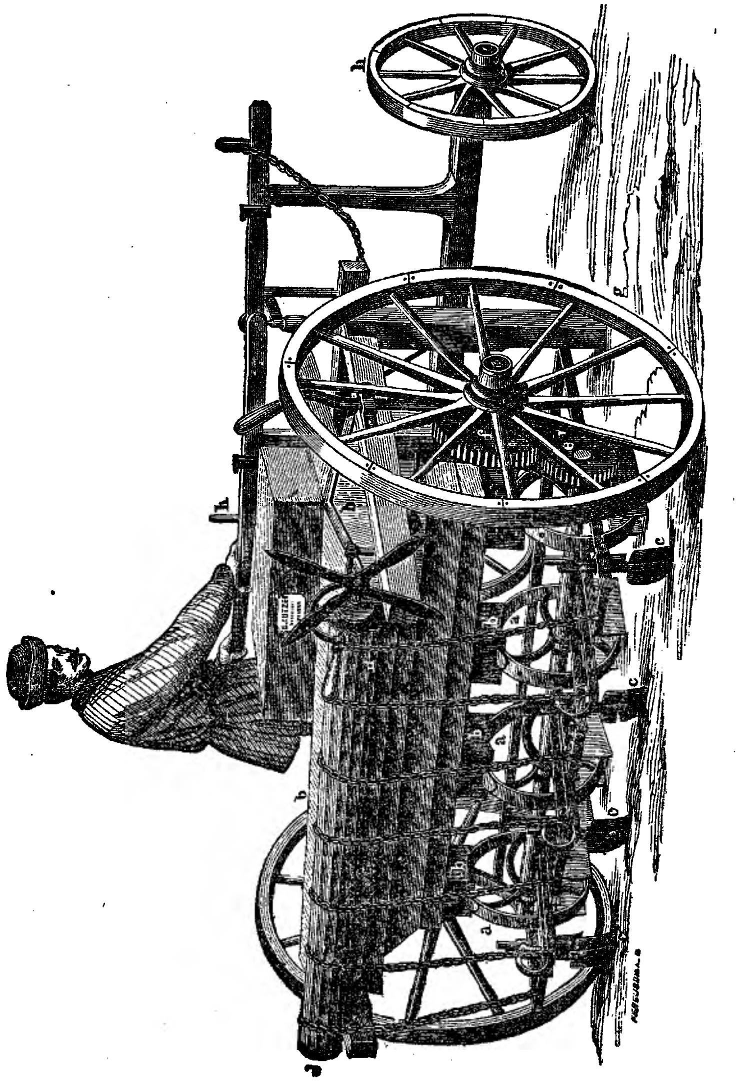


Fig. 10.

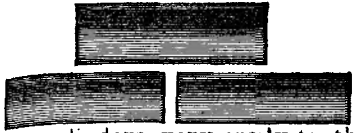
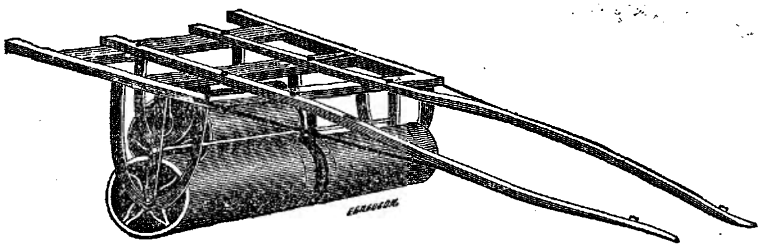


Figure 11 shows the construction of the whole roller; in regard to which it is to be noted that the holes in the guides for the roller gudgeons should be cut oval, to allow a certain amount of play to each separate roller.

Fig. 11.



CULTIVATION.

The facts observed, on the application of the human mind to the closer study of the general phenomena of plant growth, soon led to the conclusion that each individual species requires a definite time for the formation and development of its organs. In the case of many species of plants, the time at which they will come up, bloom, and bear seed, may be predicted with tolerable certainty; and when we reflect how, during the progressive development of the plant, its composition and its vital functions frequently so change that entirely different substances are formed in the plant in the early and in the final stages—that the beet, for instance, does not store away in its cells more than a small portion of its sugar until near the end of its growth, it becomes evident that time is an element of great moment as regards the perfection of the plant. Time alone, however, considered without regard to temperature, is often deceptive and insufficient for the determination of the problem, since the formation of the organs of a plant is frequently greatly delayed by a diminished temperature. How often does a cold Spring blast the hope of a seasonable harvest, and how often do we see the quality of products of every kind varying in different seasons, although the same soil, similar tillage, the employment of the same kind of manure, in the same form, etc., should bring about a uniform result.

In nothing does this variation according to season show itself more plainly than in wine, that drink of the gods, the product of which, in a favorable season, may be of the most delicious aroma and of the finest flavor, and enlivening and inspiring in its effect; while the same plant, on the same ground, may in the next year, under other meteorological conditions, yield a product entirely different from that of a good season, and rather a depressing than an inspiring beverage.

So it is with the beet; its quality is as entirely dependent upon the influences of weather, as we are unable to control those influences. I can call to mind unfavorable seasons, in which whole counties suffered by the failure of the crop, and good ones again in which sugar was obtained in great abundance and of the finest quality, by the same apparatus, and by the same methods; seasons in which a kind Providence caused the ground to produce sugar in such abundance, and so free from foreign substances, that the manufacturer received the generous bounty almost in astonishment; and every experienced manufacturer well remembers how the product of raw sugar has varied in the same factories, but in different seasons, from seven up to nine per cent.

These facts should lead to very serious reflection, and seem to me to compel the conclusion that time and heat must act in constant correlation, in order to produce a good result as regards the beet crop.

In the case of other field crops this correlation has long been recognized. We are accustomed at the present day, in general, to consider the prevailing temperature as well as the time required for their growth, observing the mean temperature each day from planting time to harvest, and at the end of growth, adding up all the observations. This total of degrees of temperature, being the product of heat and time (the number of days being the multiplier), serves under the name of "aggregate temperature" as a measure of heat, as a term to denote the combined working of heat and time during the growth of the plant. In a scientific inquiry as to the conditions of growth of a plant, the question always first arises: What aggregate temperature does it require? As regards several crops cultivated with us, as for instance wheat, we have experimentally exactly determined the aggregate temperature they require.

The experimental stations also have recently carefully observed the meteorological facts in the conduct of their experiments in beet culture, and of all these observations, those regarding the influence of heat are far the most interesting, since its effect on the formation of sugar is quite as important to us as it is in general easy to be recognized.

The warmth of southern countries greatly promotes the formation of sugar in fruits, and many crops do not grow in the northern zone, only because a few degrees of heat are wanting. The Turkish wheat (Kucurutz), for instance, ripens admirably in Hungary, but in north Germany it does not always ripen, and never so early.

Good sugar beets appear to be produced in all seasons in which the sum of the daily mean temperatures amounts to 2500° R. This aggregate temperature is divided among the several months approximately as follows:

April	180° R.	=	405° F.
May	380° R.	=	855° F.
June	444° R.	=	999° F.
July	440° R.	=	990° F.
August	450° R.	=	1,012° F.
September	354° R.	=	796° F.
October	215° R.	=	484° F.
Total	2,463°		5,541°

In the years in which I observed a smaller aggregate temperature, the beet juice was usually of inferior quality. It appeared as if the sugar had not had time to accumulate, an assumption which would seem to be confirmed by facts since supplied. In years in which not more than 2,143° R. aggregate temperature were obtained (as may be seen in the following table), the beets were poor in sugar and the juice impure.

Water serves as a solvent of the fertilizing material that may be present, and becomes the vehicle by which this is conveyed to the plant, presenting to it in a digestible form the nutriment that there is in the soil. In case of a deficiency of rain, especially early in Summer, when the young beet plants especially require substances of both mineral and organic origin in soluble form as nutriment, it is no wonder that many otherwise effective manures do not afford sufficient food in solution, and therefore fail greatly to promote the development of the beet. It is on this very account that there are so many different opinions as to the efficacy of manures, especially those classed as artificial; and for the formation of a correct decision it is therefore necessary to repeat experiments with fertilizers during several years, if possible, on the same land, and accompanied by meteorological record. In wet years, on the other hand, a surplus of dissolved fertilizing material is presented to the beet and taken up by it, to the detriment of the quality of its juice, which is thus, as long experience has established, made to contain a larger quantity of salts and proteine compounds, and at the same time less sugar.

The dilution which the beet juice suffers by taking up a large quantity of fluid from the soil, in the case of a large rainfall, and which immediately after rain frequently amounts to two per cent (Balling), makes its percentage of sugar, of course, less, since the whole sugar of the beet is combined with a larger quantity of water. With the water, however, there is conveyed to the root an abundant supply of fertilizing material in solution, which more particularly promotes the enlargement of its substance and the formation of leaves, while the quieter process of accumulating sugar is not promoted at the same time with this rapid formation of new organs of vegetation. If the rains be frequent, the tendency to produce new leaves predominates; and since the accumulation of sugar in the beet, as seems plain from the subjoined analysis, does not take place until after the full development of the leaves, the smaller quantity of sugar that beets in such cases contain is easy of explanation. The hygrometric condition of the air and the amount of rainfall, as well as the mean temperature, should therefore be noted in every experiment in beet culture, as indeed is now done at most of the existing experimental stations. I give below a table which I made upon this plan in the year eighteen hundred and sixty, and in which I only regret not having noted, also, the hygrometric condition of the air, which is certainly of great importance.

DATE.	BEETS.					JUICE.							
	Number of beets examined	Weight in grammes.											
		Of the roots	Of the leaves	Of one root	Of the leaves of one beet	Balling	Sugar	Quotient denoting purity*	Days of growth	Rainfall in inches from the time of sowing	Number of rainy days	Aggregate temperature (= days of growth x mean temperature at 7″ in the earth.)	Number of the leaves (green)
						Pr. ct.	Pr. ct.						
June 22	20	1,000	3,700	50	71	6.7	3.7	52.2	60	4.5	25	611	12–22
June 24	13	1,000	3,800	77	185	7.2	4.2	58.8	62	4.5	25	....	....
July 2	8	1,392	1,960	174	315	13.2	9.7	73.3	70	5.1	28	418	18–26
August 18	12	1,680	852	140	245	15.2	10.6	70	104	5.92	31	429	40–25
September 4	8	1,076	276	127	34.5	18.5	13.4	72.4	120	6.17	32	382	8–12
September 15	10	860	450	86	54	12	7	60	130	12.25	36	....	12–18
September 24	5	1,460	900	292	180	10.2	6.5	63.7	139	12.42	37	....	18–24
October 6	5	1,130	980	226	196	11.5	7.8	68	155	12.42	37	303	....
												2,143	

* The figures in this column indicate the percentages of sugar by the polarization process, answering to 100 of Balling's saccharometer.

The beets were planted April twenty-second; they were thinned May twenty-fourth.

This table of course presents no such regularly increasing numbers and results as many other similar comparisons. I believed, however, that I ought to set down exactly what I found, without regarding whether it agreed with our present opinions and with prevailing theories or not. At any rate, it most plainly shows the influence of the rainfall. On the fourth of September, the juice contained 13.4 per cent of sugar and 72.4 parts of sugar in 100 parts of its dry substance. By a very considerable rainfall the sugar was reduced to seven per cent, and in 100 parts of dry substance only 60 parts of sugar. There must thus have been conveyed into the beet juice by the rain a quantity of foreign substances corresponding to this difference. The number of leaves also began to increase rapidly; in consequence the further development of sugar was very slow and the juice continued impure. We shall, hereafter, return to the consideration of the results shown by this table.

Bretschneider (Journal of the Beet Sugar Industry, Vol. 2, p. 570), found in the beets of different seasons the following proportions:

In the year		sugar		nitrogen		ash	
In the year	1857,	sugar	10.95 per cent,	nitrogen	0.363 per cent,	ash	0.715 per cent.
"	1858,	"	10.63 "	"	0.377 "	"	0.815 "
"	1860,	"	10.42 "	"	0.219 "	"	0.703 "
"	1861,	"	12.78 "	"	0.168 "	"	0.755 "

I cannot but believe that the cause of the differences between the beets of different seasons is to be found in the influence of weather, since soil, manure, tillage, and seed in the same district are not liable to vary to such an extent.

Finally, among the influences commonly affecting the growth of plants, that of light is to be reckoned. In the dark a vigorous growth is impossible; the leaves remain pale. Beets grown in the shade always contain less sugar than specimens from clear places, always exposed to the action of sunlight.

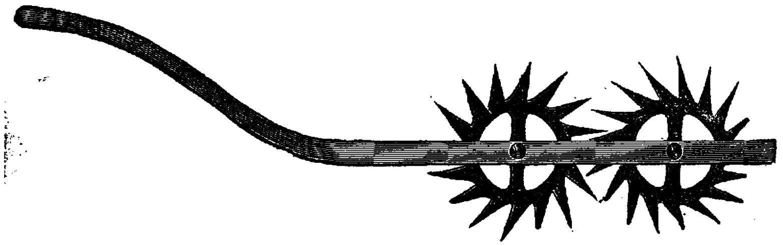
Passing from these general to the consideration of more special points, as regards the growth of the beet, first of all stands the vigorous development of the germ leaves and the first rootlets. Since the parts of the plant that are first developed contain all the organs for the reception of its food, it is plain that the young plant can take up and assimilate more, and, therefore, grow more luxuriantly, the more vigorous, under conditions otherwise similar, the early development of these organs is. The stronger the fibrous roots, the larger is the surface by which they draw nutriment from the soil; the more vigorous the growth of the first leaves of the plant, the more nutritive material can they absorb from the atmosphere. A plant that has become sickly in its early growth will never afterward attain a perfect, or, at least, a normal development. Upon this account seed manuring has already been recommended, from its admirable effect in producing an early, vigorous growth.

The numerous enemies of the young beet render it particularly desirable to accelerate its growth when young as much as possible. For this purpose nothing is more effective than a fertilizer decomposing with the greatest rapidity, and especially one containing the elements which the beet requires at this period of its growth. Moreover, since the beet is a potash plant, and since urine is known to contain a large quantity of alkalies in soluble form, as phosphates and sulphates, it would appear to be the material best adapted for seed manuring, as has actually been proved in my experiments.

Young plants usually grow better from seeds which have been sown a number in a place (cluster sowing) than when sown in rows; and the reason has been assigned that the heat, produced in the unfolding of the germ and its further development, is more concentrated in consequence of the contiguity of the seeds, and the growth of the plants thereby promoted. At any rate, plants in stout bunches afford, as has been already remarked, a larger supply of food for injurious insects; and there is, therefore, more probability of one uninjured plant remaining than in the rows, in which the plants standing separately sooner succumb to the attacks of insects, to whom, also, the row of plants points out an easy road to their food; whereas, in the method of cluster sowing the bare ground from bunch to bunch is not crossed so quickly or so easily. The stout bunches of beet plants are, moreover, not so much injured by any night frost that may occur; and, finally, they are better able to break through any crust that may be formed by heavy rain and strong wind after it.

This crust on heavy soils is often so hard that all the bunches are unable to break through it, and the crop is often much diminished by their failure. Mr. Kutzer, of Dürnkrut, has constructed a sort of small spike roller, which, in such cases, may be passed over the crust so as to break it up without injury to the sprouting beets. The accompanying sketch (fig. 12) sufficiently explains this machine.

Fig. 12.



The strength and elasticity of the young plant lift it from the bent position in which it was held in the seed, and two virgin leaves see, for the first time, the rosy light and sunny sky which called them forth. This growth is attained under favorable circumstances in fifteen days, and the length of stem and root is then about two inches. As soon as the young plants may be seen nicely, the first hoeing is immediately proceeded with, in order to destroy the weeds immediately while still young, and by loosening the soil to promote the growth of the beet plant. This first hoeing, which, in Magdeburg, is considered of great importance, is usually neglected in other countries from motives of economy; not reflecting that, by allowing the weeds to grow, not only is nutriment withdraw from the soil and from the beets, but the whole subsequent growth of the plant is affected injuriously.

As soon as the beets have leaves about three inches long, so that they may be conveniently taken hold of, they are thinned or singled. The strongest and the most vigorous plant is held with one hand, and the rest are pulled out with the other.

When the plants are in clusters it is very apt to be the case that the tender roots are intertwined, so that tearing out the others very much disturbs the one plant that is to remain, and checks it in its growth. This evil is avoided by sowing in rows, in which the plants, from the very beginning, stand so far apart that they are not affected by the pulling out of those nearest them. They grow on undisturbed and unchecked; whereas, the plants left out of the bunches usually fall over after singling and do not straighten up until the next day, and, indeed, may not entirely recover until some time after.

It has been maintained that the formation of the green head of the beet is caused in this way, by the upper part of the root remaining uncovered by earth and exposed to the air.

The thinning should be done as early as possible, since the plant grows decidedly faster when the whole strength of the soil is devoted to it, instead of being shared among a whole cluster. If the plants remain long unthinned the leaves grow long and assume a yellow color; on the other hand, the plants thinned at the proper time have a dark, green leaf of the natural shape. Early thinning is therefore decidedly to be recommended, and most growers maintain that beets thinned early are heavier and richer in sugar. Wet weather is preferred for the operation, and it has been observed that the day on which the beets are thinned always has an effect upon the subsequent growth.

The labor required for singling varies according to the aptitude and experience of the laborer; the work is usually done by children, who are better adapted to it, because they do not have to stoop so low, and four or five days' work are allowed for singling a morgen. For each hoeing, which may be an easy or arduous task, according to the quantity of weeds and the condition of the beets and the weather, four or six hands per morgen are usually reckoned; the hoeing is usually easier afterward than at the beginning.

A second hoeing quickly follows thinning; the soil is thus loosened, the air penetrates the ground and fresh nutriment is supplied to the rootlets of the plant. This, as well as the destruction of the weeds, is the object of hoeing.

On this account, hoeing produces a very beneficial effect upon the growth of the plant; and the sayings, "the beet requires much hoeing" and "hoeing makes sugar," are generally recognized as correct; nor must we regard the effect of hoeing on the formation of sugar as altogether indirect. By loosening the surface soil, hoeing increases its hygrometric capacity, which, especially in Summer, it should be sought to promote, because at this hot season the beet requires the largest supply of moisture. Moreover, by the wise provision of the Almighty Creator, the moisture of the air is in Summer at its highest; a large quantity of moisture thus penetrates with the air through the surrounding surface occupied by the beet, loosened and enlarged by the use of the hoe, into the circle from which the beet derives its nutriment; and a more luxuriant growth is the result. Since, however, hoeing promotes the earlier formation of the leaf organs of the beet, it becomes in this way the indirect cause of an early and more copious formation of sugar, since it is only after the attainment of a vigorous leaf growth that the beet begins the process of forming sugar; and the earlier this occurs the more sugar will in general be produced. That the beet in the earlier part of its growth forms chiefly solid substance, and especially its leaf organs, and only afterward developes sugar in disproportionately high quantity, is shown by the table previously given, from which it further appears that up to the middle of July there is a greater growth (by weight) of leaves than of beets. Even on the second of July the average weight of root was one hundred and seventy-four grammes against two hundred and forty-five grammes of leaves, and in June the proportion was still more remarkable, for on the twenty-second of June there were fifty grammes of the root to one hundred and eighty-five of leaves. It thus appears that in the early growth of the beet the tendency is first to form leaves, and that we therefore ought to assist this effort of nature by means of hoeing. This observation regarding the growth of the beet is by no means unsupported.

Leplay found, in France, "that the leaves, up to the fifteenth of August, were heavier than the roots; that so long as the leaves grew, the roots increased proportionately little, and did not begin to grow until after the complete development of the leaves; as also that the percentage of sugar began to increase very remarkably and disproportionately with the vigorous growth of the root."

It is, however, worthy of remark, that in the full-grown beet the leaves have very various proportions to the root, according to soil, manuring, and culture. Thus, in Zöller's experiments, there were from seventy-four to two hundred and twenty-six parts leaf to one hundred of beet, so that the leaf growth of the beet can only be regarded as an approximate indication of the crop up to the beginning of July.

My experiments, reported above, were made in southern Russia, in the year eighteen hundred and sixty-one. Dr. Paul Bretschneider reported his experiments in Germany, in the same year, in the Journal of the Association of the Beet Sugar Industry (page 578), as in the following table:

	DATE OF THE EXAMINATION.	Number of beets examined........	Weight of one beet in grammes	Weight of the leaves of one beet............	Proportion of roots to leaves...	Percentage of sugar in the beet..	Percentage of sugar in 100 parts of the juice.
(Thinned)	June 12th...........	374	0.2005	?	?	2.13	?
	June 21st...........	16	5.3	?	?	4.78	?
	July 1st.............	4	32.5	?	?	3.12	?
	July 9th	3	78.3	286	1:3.65	4.99	?
	July 16th	3	109.6	226	1:2.06	8.86	?
	July 23d.............	3	82.0	168	1:2.04	10.24	12.16
	July 29th	3	166.0	224	1:1.34	?	13.28
	August 8th.........	3	124.0	107	1:0.56	11.27	14.44
(Rain)	August 10th........	2	221.0	162	1:0.73	9.42	12.72
	August 17th........	6	238.0	165	1:0.69	10.13	12.92
	August 26th........	3	228.0	121	1:0.53	10.52	12.16
	September 4th....	3	300.0	170	1:0.56	12.84	14.88
	September 14th...	3	257.0	139	1:0.54	11.23	14.20
	September 19th...	1	586.0	346	1:0.59	11.	12.16
	September 19th...	1	323.0	94	1:0.29	11.68	14.20
	September 19th...	1	214.0	64	1:0.30	11.70	13.76
	September 19th...	1	188.0	65	1:0.34	13.04	15.86
	September 19th...	1	143.0	72	1:0.50	11.27	?
	September 19th..	1	204.0	50	1:0.25	13.15	14.88
	September 19th...	1	169.0	38	1:0.22	10.80	13.40
	October 10th	3	437.0	?	?	12.03	13.56

It would seem, then, to be well established by observations in three countries, differing so much in climate, that the early periods of growth of the beet are specially devoted to the formation of leaves, the organs of vegetation below ground—the roots—on the other hand, developing more slowly, whereas, in the latter periods, the case is reversed.

From the foregoing table, it further appears that the time most favorable for hoeing is up to the last of July (or eighth of August). By this time all working among the beets should come to an end, since the object of hoeing—to hasten and strengthen the growth of the leaves, the air-conveying, breathing organs of the plant, whereby the root is enabled to begin its sugar-forming operations as easily as possible—is accomplished; the leaves are now sufficiently developed to coöperate effectively, according to their function, in the process of sugar formation in the root. The beet must now be allowed rest, so as to be able to dispose and concentrate its powers for the process of sugar formation in its interior that now begins to take place, and it should not be again diverted by hoeing, to the now superfluous, because already completed, leaf formation. If the soil about the beet be much loosened after this time, the growth of leaves would indeed yet be induced, but at the expense of the saccharine matter in the beet, since it appears undeniable from my experiments that the excessive formation of leaves impairs the quantity and quality of juice. In the maxim of the beet grower, "the root must have rest," lies, therefore, a generally recognized truth, which, indeed, is founded not upon exact principles of plant physiology, but upon the experience of many years.

Opinions differ as to how frequently hoeing should be done up to this prescribed time. In Madgeburg, where the interest of the beet growing sugar manufacturer is well understood, it is repeated at least three times, frequently even five times; and this may, perhaps, be one cause of the Magdeburg beets being generally very rich in sugar, and their juice very easy to manufacture. The beet growers of other countries save the expense of this repeated hoeing, partly from false economy, partly from lack of a sufficient, or a sufficiently cheap, supply of labor, and content themselves in many cases with hoeing twice. No wonder if unsatisfactory results, both as to quantity and quality, ensue.

Frequently repeated hoeing is, perhaps, only disadvantageous when a soil of slight retentive capacity, as, for instance, sand, is used in very hot and dry climates for growing beets. In such extreme cases I have even found that the beets withered in the ground, and could be drawn out with great ease, so large was the evaporation. In such cases, much loosening of the soil would only promote the evaporation of its moisture; and in such countries (Hungary and southern Russia) we should rather advise means to check the loss of moisture by evaporation, such as planting hedges and trees. "Trees," says Humboldt, "are, in consequence of the nature of their evaporation and the radiation of their leaves, surrounded, in spite of a continually cloudless sky, with a cool, moist atmosphere. They exercise an important influence upon the supply of springs; not because, as was long believed, they attract the vapor diffused in the air, but because they protect the ground from the direct effect of the sun's rays, and thus diminish the evaporation of rain water. If the forests are destroyed, as was done with inconsiderate haste by the European settlers in America (and, I may add, not only in America), the springs dry up, or, at least, greatly diminish." This remark can be as truly applied to southern Russia, where the hot winds pass over plains destitute of trees and shrubs, and cause the moisture to evaporate with incredible rapidity. How considerable the evaporating power of the wind is, and how, in this respect, it surpasses even the heat of the sun's rays, is shown by the experiments of Mr. Charnock, who experimentally established that the sun and wind evaporated 33.6 to 34.2 inches of water, while water, shaded from the sun and exposed only to the wind, lost 22.5 to 22.7 inches; that is to say, about two thirds as much. (1) This drying power of the wind is generally recognized in daily life; for every washerwoman hangs the clothes in the wind, or draught, to dry. Trees and hedges do not permit the wind to pass with the same velocity directly over the ground in the same direction. It would, perhaps, be of great benefit to intermix some hygrometric substance, not prejudicial to the extraction of sugar, with the surface soil of the beet field, partly in order to attract to the soil a portion of the great volume of moisture in the air and make it available to the organs of the root, partly to recover the moisture exhaled by the beet leaves, and not to permit it to be lost in the air. From the large surface of the beet leaves this exhalation must be quite considerable; for it amounted, according to Mr. Phillips, to 2.01 grains of water daily to each square inch of leaf surface in the polyanthus. (2)

The cases in which the repeated working of the ground between the beets can be injurious are, however, exceptional, and do not occur in climates favorable to the manufacture of beet sugar. The hoe is, therefore, upon the whole, a very important instrument in beet culture; and a frequent use of it is very advisable. It is a good plan frequently to sharpen these implements, which are continually getting dulled by the sand contained in the soil. Wheelbarrows with grindstones for the constant sharpening of the hoes in the field are, therefore, highly to be recommended, because sharp tools are better for cutting up and destroying weeds; and, besides, they penetrate deeper into the ground, thus more perfectly accomplishing the loosening up of the soil. Care is, however, always to be taken in hoeing, and especially the first time, that the beets are entirely covered with earth, and the upper part not left exposed to the air; otherwise, what are called "green heads" are formed, which always contain an impure and slightly saccharine juice.

On account of the great importance of the growth of the leaves, a point requiring particular attention is that none of the leaves be injured in hoeing the beets. The leaves are vital organs. Through them nutriment is drawn from the atmosphere, and they effect the interchange of gases. In their formation the foundation is laid for the subsequent growth of the root and the accumulation of sugar in it. By breaking them off, the means to this end are so much impaired.

Hoeing is also often done by machines; and opinions are divided, according to local circumstances, as to whether this method is to be preferred to hand labor, or the reverse. It must be conceded, to begin with, that the machine cannot entirely replace hand labor in beet culture, since the machine can never be run close to the beets, from the fear of injuring them. It can thus only be used upon that part of the field between the beet rows, lying about an inch from the beets on either side.

If the question be asked, how can this part of the ground be most quickly and cheaply cleared of weeds and loosened, the decision is always in favor of machine work; since machines, drawn by horses, do the work more quickly and cheaply than by hand labor, which is also often difficult to procure.

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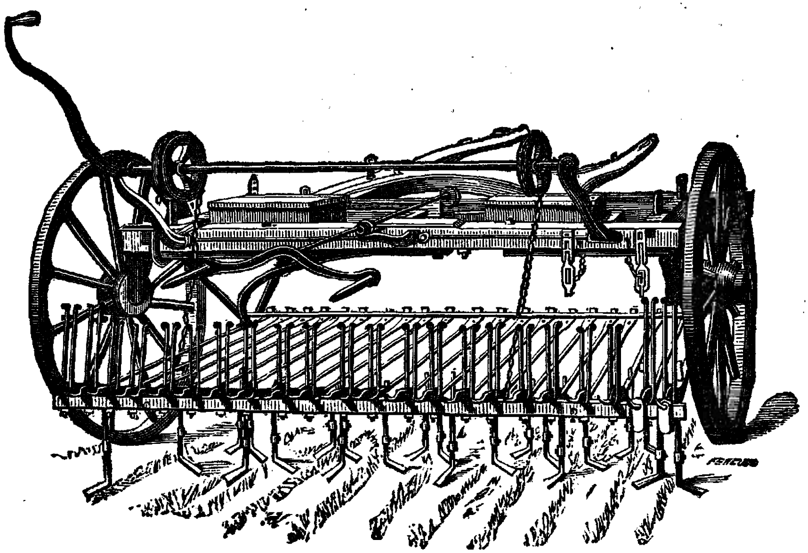
(1) Farmer's Magazine, 1861, vol. 19, p. 101.
(2) Cuthbert W. Johnson. Farmer's Magazine, 1861, vol. 19, p. 101.

In very extensive culture the machine is indispensable, since it is almost impossible to have at command a sufficient number of hands for a large surface for a short but fixed time, and only smaller growers in populous districts can supply themselves with a sufficient force within a short space of time. The large farmers are almost compelled, for an extensive beet crop, to call the machine to their aid; for others, it is a matter of time, because, even in thickly populated districts, the expense of hand labor exceeds that of the machine.

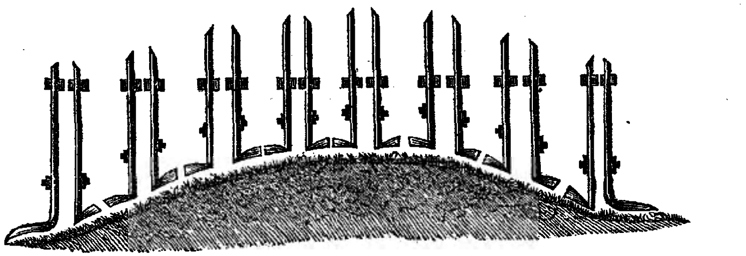
A weeding machine in very general use is that of Garret, of which a drawing is given (fig. 13); it cuts the weeds between the rows by means of two knives, and cleans four or more spaces at once. The arrangement for lifting the knives, by which the risk of injury to the beets is diminished, is so simple and ingenious that the workman very soon becomes familiar with the machine, and can guide it successfully through the beet field.

Fig. 13.



This machine will hoe even rounded-up lands, and, generally uneven surfaces, if the hoe blades are arranged accordingly, as shown in fig. 14.

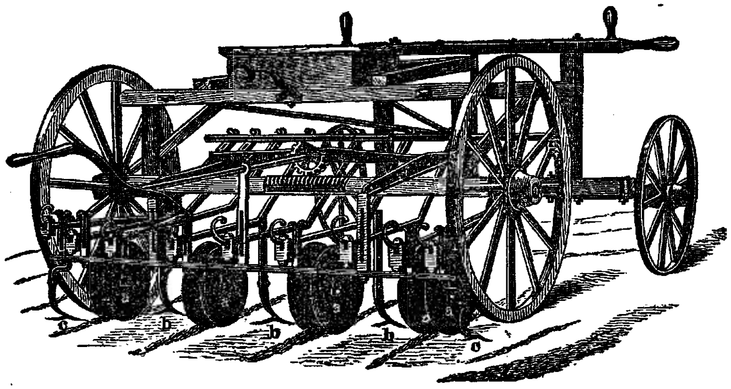
Fig. 14.



The only disadvantage this machine has is that, in young beets, the plants are apt to be buried by the knives digging up and displacing the earth.

Mr. Siedersleben has remedied this by applying, which he was first to do, a shield, the protecting disks *a a* (fig. 15), which can be used for the benefit of the young beet plants shortly after their coming up, and by which the earth is prevented from covering the plants.

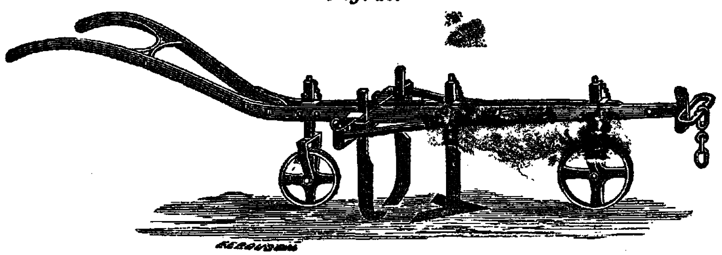
Fig. 15.



The capacity of a machine of this kind is about twelve morgens a day. This is of so much the more consequence in beet culture, because the weeds begin to make their appearance at the same time on all fields in Spring; and it is of the greatest importance to destroy them at this very moment, in order that the beets may not be retarded, "allowed to choke," as we say. With regard to this, I may, at the same time, suggest that, in consequence of simultaneous sowing, the thinning, also, and the hoeing of the beets are crowded into a short space of time; whence arises the difficulty of finding sufficient force for the purpose. It is, therefore, to be recommended to sow the beets at different times, and by this means to divide, also, the time of thinning and hoeing more. If the intervals between the rows have been cleaned by the machine, there remains to be worked with the hoe only a small strip of a few inches immediately by the beet plants; the weeding which may be easily taken care of with a few hands.

Another machine, by Ransome, called a horse-hoe, is shown (fig. 16). It is used, also, for cleaning and loosening the ground between two rows of beets, is easily adjusted for different distances, and is very effective. The irons which hold the knives in the ground and connect them with the frame, should be round, because weeds fall back more easily from a round iron than from an angular one; and by having the irons always clean, the work is considerably expedited. It is, of course, understood, that all machines are only to be used in dry weather. The ground should by no means be worked while wet.

Fig. 16.



Having now studied the cultivation of the beet in the early stages of its growth, let us consider more closely its structural and chemical composition, as well as the effects resulting therefrom upon the subsequent growth. The beet consists of an aggregation of cells, in which a light-colored juice is contained. The number of cells amounts to one and a half millions to the cubic inch; and when we reflect that this constitutes no more than three to five per cent of the weight of the beet, we cannot but admire the delicacy of these structures. Nevertheless, they are very strong, for the juice which they contain can only be extracted, and with difficulty, by breaking up the cell walls. The cell walls consist of cellulose, upon which pectine, a gelatinizing substance, is deposited.

The juice of beets is a solution in water of solid substances, consisting of sugar, salts, nitrogenous matters (proteine substances) and a compound substance of undefined chemical character and of organic origin, constituting the solid matter extracted. The percentage of water in the beet varies in different seasons, as the weather is wet or dry, as well as in the different periods of its growth; the young beets always containing more.

Dr. Bretschneider determined the percentage of water in the juice at different periods, as follows:

July 20	88.78 per cent.
August 9	88.99 per cent.
August 31	86.62 per cent.
September 1	85.46 per cent.
September 30	82.19 per cent.
October 16	82.19 per cent.

The proportion between the weight of the solid substances and of the sugar in the juice, is usually expressed by what is called the "sugar percentage quotient" of Balling; that is to say, a number which denotes how much sugar is contained in one hundred parts of the solid substance of the juice. This number directly expresses the relative value of the juice for manufacture, and we shall frequently recur to it hereafter under the term "relative percentage of sugar." All the other solid substances, except sugar, are grouped together under the collective term "foreign substances," or "not sugar."

A horizontal section of the beet shows it to be composed of numerous concentric rings. The breadth of these rings has remarkable and actual, though as yet unexplained, relation to the percentage of sugar in the juice; a greater breadth of concentric rings corresponding to a less saccharine, and a less breadth, in most cases, to a more concentrated juice, in which more sugar is contained.

The concentric rings, which, according to Schacht and Dr. Bretschneider, are arranged about a central skein of vascular fibers, are in direct structural relation with the several leaf circles, and connect the oldest, outermost leaves with the oldest innermost rings; the youngest innermost leaves, on the other hand, with the youngest outermost rings. We hence conclude that the nutrition of the several rings is dependent upon the correspondent leaf circles.

In order to confirm this opinion, Dr. Bretschneider determined the proportionate development of leaves and rings in the beet at the different periods of their growth, in researches in the highest degree ingenious and instructive. He gives the following results:

	Developed leaves.	Concentric rings of the beet.	
July 20th	9 to 12	4	
August 9th	15 to 18	5 to 7	
August 31st	18 to 28	7 to 8	Many leaves already yellow and partly fallen off.
September 15th	18 to 28	7 to 8	
September 30th	18 to 28	7 to 9	
October 16th	18 to 28	8 to 9	

The outermost ring of a beet well advanced in growth must, however, because it is connected with the innermost small leaves, often not developed until late in the season after rain and of slight capacity of growth, contain less sugar than the inner rings of the beet, communicating with the usually larger outer leaves.

In accordance with this assumption, Doctor Bretschneider found the outermost ring to contain the least sugar, in his examination made on August seventeenth of the encircling rings of the beet, separately, with reference to their percentage of sugar. They contained as follows:

	Per cent.
Head	9.38
Sixth ring (outside one)	9.38
Fifth ring	12.31
Fourth ring	11.78
Third ring	11.07
Second ring	10.93
First ring (inside one)	10.15
Root end	9.95

From this he concludes, with Schacht, that *the older, full grown green leaves are indispensable for the production of sugar; that they represent the actual organs of sugar formation.*

The leaves seem at the beginning to appropriate to themselves all the nutriment derived from the soil and atmosphere, but, after attaining a certain size and surface, to exert an influence upon the formation of the rings with which they belong, in order finally to devote their energy exclusively to the formation of sugar.

This theory is confirmed by some highly interesting experiments made by Schacht. On August fourteenth he caused all the full-grown leaves to be removed from six beets, whose juice contained 8.6 and 8.34 per cent of sugar, and left only the young undeveloped leaves in the middle of the crown. On September fifteenth, these beets were again in full leaf, and distinguishable only by the fresh green of their leaves and the absence of withered ones. The new leaf formation was again almost entirely removed, and was fully renewed a second time by October fifteenth. At harvest, October thirty-first, these beets that had been twice stripped of their leaves, contained a juice of only twelve per cent Balling and 8.34 per cent sugar, while the beets that had not been stripped, but were left undisturbed, produced a juice of sixteen per cent Balling and with 13.72 per cent of sugar. A second experiment of the same kind, on manured land, resulted as follows: (¹)

Beets not stripped..................14 per cent Balling, 9.96 per cent sugar.
Beets stripped........................ 9 per cent Balling, 5.34 per cent sugar.

The beets that had been stripped of their leaves were, however, not inferior to the others in their aggregate weight, and from this it would seem that *the perfectly developed green leaves, though they contribute no further to the increase of the beet in weight, have nevertheless the power of essentially promoting the production of sugar.*

A condition of weather which hinders the formation of leaves must cause also a deficiency in the product of sugar. The table given at the beginning of this chapter, with reference to the growth of beets in Russia, shows 13.4 per cent of sugar on September fourth, being the highest during the season, and in October only 7.8 per cent. The dry weather had caused the leaves, up to September fourth, to wither and fall off; heavy rain ensuing, had the effect indeed of developing a quantity of new leaves, but too small for a vigorous performance of their proper functions, and the beet, therefore, was enabled to increase in size and weight, but not in the quantity of sugar it contained. A hot, dry Summer, with rain in Autumn, never produces a beet crop the manufacture of which can be satisfactory, since the time of the most abundant formation of green leaves should not be simultaneous with that of ripening. In such cases it might be advisable to lay the beets, immediately after lifting, in heaps, with the leaves on the outside, in order to give the leaves, after taking the beets from the ground, a sufficient time to carry out and complete their office of accumulating sugar, and in this way an excess of injurious matter taken up from the soil by the beet may also be avoided. Damage to the leaves during growth, by hail, insects, etc., must likewise result in a diminished product of sugar. As early as eighteen hundred and twelve, Achard held the same view that we do now with regard to the effect of the leaves on the formation of sugar, remarking, "that by removal of the leaves the conversion, refining, and elaboration of the coarser matters, which the plant by means of its root extracts from the soil, will be impeded."

We are not, however, to conclude that the sugar contained in the beet depends altogether upon the leaves, their size, and their number. If so, how could we explain the fact first observed by Leplay, that beets on soils abounding in lime have leaves less in size and number, but contain more sugar, than the large leaved beets grown on other soils. As

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(¹) Journal of the Beet Sugar Industry, vol. xi, p. 133.

regards the production of sugar, therefore, the soil, and the nutriment which it affords, must be considered of more importance than the leaves.

Beets vary greatly in their composition, not only in different periods of their growth, but also at the same time and on the same ground. We frequently find considerable difference, in the quantity of sugar which they contain, between two beets growing side by side: and it is, therefore, always necessary to examine a number of beets taken from different parts of the field, in order to judge the value of the crop. Since the beet, by reason of its shape, derives its nutriment from a very small circle, it may easily happen that, from irregularity in the distribution of the manure, entirely different nutriment may be supplied on different spots, thus frequently causing great variation in quality.

Every beet has two indentations, on opposite sides, which frequently run spirally, but in many cases almost directly downward. The poorer the soil, the longer and stronger are these small side roots; for the beet is then compelled to seek at a distance what it does not find close at hand, and so frequently throws out rootlets from its entire surface. If, however, a sufficient quantity of fertilizing material be present in the soil, these fibrous roots are small but often occur in large numbers, especially in case of abundance of rain. The subsoil appears also to influence the formation of the root, its looser, moister, and more fertile character inducing a deep penetration of the small fibres of the main root. Schacht states that they penetrate as much as eight or ten feet. At Czakowitz they were found at the depth of five feet, where they grew into the drain pipes. Penetrating so deeply, the plant supported itself principally from the subsoil by means of its small but proportionately more numerous fibrous roots.

As is evident from all the tables above given, the beet has a constant increase in weight during the whole time of its growth; in this, all experiments agree.

Balling, for example (Journal of the Beet Sugar Industry, vol. 9), gives the total weight of thirty beets, examined at various dates, as follows:

August 29	51 lbs. 1½ oz.	= average 1 lb. 11¼ ozs.
September 15	60 lbs. 5½ ozs.	= average 2 lbs. ⅛ ozs.
September 30	68 lbs. 7½ ozs.	= average 2 lbs. 4⅛ ozs.

From which it appears that the beets, upon an average, gained one quarter of a pound in fifteen days.

If, now, we sow at fourteen inches apart, which gives eighteen thousand plant spaces per morgen, of which seventy per cent, or twelve thousand six hundred, are occupied by beet plants, the weight of the crop, at one pound per beet, on—

September 15, will be		12,600 lbs.
September 30, will be	$(12,600 + \frac{12600}{4})$	15,750 lbs.
October 15, will be	$(15,750 + \frac{12600}{4})$	16,900 lbs.

Dr. Bretschneider states that in his experiments (Journal of the Beet Sugar Industry, vol. 10, p. 155),

	The average weight of the beets was—pounds.	The proportionate yield per morgen would therefore be—pounds.
July 20	0.086	1,908
August 9	0.311	6,894
August 31	0.599	13,266
September 15	0.723	16,002
September 30	0.735	16,272
October 16	0.852	18,864

The slight increase in weight, in the interval between September fifteenth and thirtieth, should not be taken as indicating the usual progress of growth, since the weights of single beets only were taken; and in this way the weight of the bulk can be ascertained only approximately.

Every practical beet grower knows from experience of how much importance, as regards the yield, is the prolongation of the growing season of the beet. Of even greater importance, however, to the manufacturer, is the increase of sugar in the beet in the last days of growth.

Balling found in his experiments in Bohemia, in eighteen hundred and fifty-nine, that the percentage of sugar in the beet juice increased as follows:

	In the juice.	In the solid substance of the juice.
August 29	9.13	73
September 15	11.00	76
September 30	13.07	80

Bretschneider, in Germany, found the percentage of sugar, in eighteen hundred and sixty, to be as follows:

	In the beets.	In the solid substance of the beets.
July 20	4.59	40.46
August 9	4.15	46.77
August 31	7.81	58.37
September 15	9.17	62.98
September 30	11.81	66.31
October 16	11.90	66.81

My experiments in Russia, in eighteen hundred and fifty-nine, gave the following results:

	Sugar in 100 Parts of Juice.		In 100 Parts of Solid Matter of the Juice.
	Balling.	Sugar.	Sugar.
1859, in the first year			
July 27	13	9.41	72.4
August 12	15.8	11.83	75
August 27	15	11.83	78.3
September 12	16.2	14.17	87.4
Heavy thunder storm			
September 26	14.6	11.83	81
1860, in the second year(*)			
April 28	16.5	11.83	73.25
June 20	4.2	1.00	24.3

(*) It appears from the table that the proportion of sugar in the beet diminishes in the second year, just as it increases in the first year.

These experiments show a constant increase of sugar in the juice, corresponding to the progress of the growth of the beet, and a larger ratio of increase of sugar than of the other solid substances in the juice. In seasons which admit of a later gathering of the beets, the manufacturer obtains a raw material not only richer in sugar but also purer; that is to say, a juice containing in one hundred parts of its solid substance less of salts and proteine substances, and therefore more easily purified, or yielding more crystallizable sugar, at less expense in the removal of these substances. This latter very important circumstance goes to explain why late sowed beets often work badly in the factory, and teaches us to hasten the time of sowing.

I made the following comparative experiment, as to the influence of the time of sowing upon the character of the juice, at Smela, in southern Russia, in eighteen hundred and sixty-one. The beets were all examined on October tenth:

Day of sowing.	The beet juice contained—
April 12	11.2 Balling, 8.5 sugar, 76 sugar in 100 parts of solid matter
April 28	11.5 Balling, 8.3 sugar, 72 sugar in 100 parts of solid matter
May 12	11.7 Balling, 8.3 sugar, 71 sugar in 100 parts of solid matter

The disadvantage of late sowing is here shown very plainly in the unfavorable composition of the juice of late sown beets. On the examination in the polarization tube the juice of the beets sown on April twenty-eighth and May twelfth very quickly became cloudy, while that of the beets sown on April twelfth remained clear. Experience teaches, however, that beets, the juice of which when under examination quickly becomes cloudy, work badly in manufacturing (a fact which I frequently observed during my tour among the Bohemian factories in eighteen hundred and fifty-seven and eighteen hundred and fifty-eight), and from this it plainly follows that, under similar circumstances, early sowed and fully developed beets are always easier to manufacture and yield more merchantable sugar than those sowed late.

Marchand published in the "Annals of Agriculture" the results of similar experiments, which he grouped together as follows:

DATE OF SOWING.	Density of the juice.	Percentage of sugar.	Other solid substances.	Percentage of water.
May 5	16	12.5	7.3	80.2
May 10	15	11.5	5.7	82.8
May 25	13.6	10.5	5.6	83.9
June 5	12.6	8.9	5.6	85.4

The same injurious effect results in wet seasons, in which the rain continually induces new growth, which impairs the purity of the juice, as is shown in my tables given on previous pages, by the difference in the juices on the twelfth and twenty-sixth of September, eighteen hundred and fifty. Heavy rains, as well as the withering and falling off of the leaves during extreme heat, also frequently cause, during growth, a certain diminution and subsequent restoration of the quantity of sugar. Dr. Bretschneider, who established this fact by exact observations (Journal of the Beet Sugar Industry, vol. 2, p. 580), very properly bases upon it the repetition of his remarks upon the importance of meteorological records.

All these facts regarding the favorable effect of the prolongation of the growing season are further confirmed by Dr. Bretschneider in his comments upon the analyses published in the Journal of the Beet Sugar Industry, vol. 10, p. 160, in which he shows how the formation of the solid, organic, and inorganic constituents of the beet, with the exception of the sugar, is always lessened during the later stages of growth, so that analysis always shows a smaller percentage of them, as in the following table:

DATE OF ANALYSIS.	Percentage of ash.	Percentage of nitrogenous compounds.
July 20	7.31	18.61
August 9	6.81	18.67
August 31	6.66	15.06
September 15	5.02	14.74
September 30	4.33	13.92
October 16	3.83	12.84

The mineral constituents of the beet were thus mostly reduced to half their original quantity, the proteine substances to two thirds. If it were possible to effect a similar improvement of the juice, if only in a small degree, by means of a prolongation of growth after gathering and removal of them from the ground, by means of the "after ripening," as it is called, of the beet, which is promoted by allowing the beets to lie with the leaves unremoved, much would be gained in the interest of the manufacturer. At all events, this idea deserves, as has already been remarked, to be more closely tested in actual practice.

As the more mature and more fully developed beets excel the younger ones in their larger percentage of sugar and less proportion of injurious substances, so likewise among beets otherwise similar; difference in size appears in most cases to be accompanied by a difference in quality, small beets usually containing more sugar and a smaller quantity of saline constituents than large ones. Herrmann found:

	In Silesian beets.				Siberian beets.	
Percentage of sugar............	11.4	9.4	9.5	7.4	5.9	5.1
Weight of beets in ounces......	6	13	23	45	16	40

Knapp states that in Russia, up to 50° of north latitude:

Beets weighing 4 to 8 ounces contain 10 to 13 per cent of sugar.
Beets weighing 8 to 16 ounces contain 9 to 12 per cent of sugar.
Beets weighing 16 to 32 ounces contain 8 to 11 per cent of sugar.
Beets weighing 32 to 64 ounces contain 7 to 10 per cent of sugar.

In the Parliamentary report on the Irish sugar production (Journal of the Beet Sugar Industry, vol. 3, p. 32), it is stated "that the percentage of sugar diminishes with the increase in weight of the beet."

From all the published examinations (by the Balling saccharometer) of Bohemian sugar beets, I have compiled the following table:

WEIGHT OF BEETS, POUNDS.	No. of experiments of which the average is taken.	Percentage of sugar in the juice.	Percentage of sugar in the solid substance of the juice.
0.5 to 1.5	28	13.5	80
1.5 to 2	22	12.7	78
2 to 2.5	23	12.2	79
2.5 to 5	29	11.7	77

It is evident, therefore, from the average of the results of these one hundred and two examinations, by the only investigator, who has carefully recorded during a series of years, the weight of the beets examined that, in general, beets of less weight contain a juice richer in sugar, an with less injurious matters, and therefore purer than that of the heavie beets.

The rule is, however, by no means without exception, and moreove does not hold good when we compare beets, which may be at differen stages of growth, but only with such as are of equal age and simila degree of development. Thus, further examinations on August twenty ninth, eighteen hundred and fifty-nine, showed in beets from one to tw pounds, 10.2 per cent of sugar, and in the solid substance of the juice seventy-three per cent, and in beets of two to two and a half pounds seven per cent. In this case, therefore, the beets weighing two pound August twenty-ninth, contained a smaller percentage of sugar than th October beets of three pounds weight in the foregoing table.

Large beets, with an equally high percentage of sugar, as in smal ones, occasionally occur as exceptions to the general rule. In these on hundred and two experiments, for instance, the highest percentage c sugar (15.16) occurred in beets of over two and a half pounds, and th smallest (seven per cent) in beets of less than one and a half pound Such occasional phenomena cannot, however, invalidate the we established fact now recognized in all countries, as by Leplay, who, fro his examination of the French beets, declares that "the small beets ar commonly richer in sugar." The beet-grower may hence draw the co clusion, that it is profitable to diminish the size of the beets, as far a practicable, by close planting. The stand should always be in propo tion to the fertility of the land; the smaller the quantity of assimilab substances contained in the soil, the wider the intervals at which th beets should be grown. If the soil be rich in nutritive substances, suc as ammonia and soluble phosphates, very close planting is advisable.

Covering the crowns of the beets at the time of hoeing, hilling them, it may be termed, is highly to be recommended as a means of increasin the yield of sugar, if only it be fully completed by the middle August. Many manufacturers invariably have their beets hilled i growing; and rightly, since in beet culture every means should employed to induce the growth of the smallest proportion of the ro out of the ground, as that part is always of less value for manufactu ing, than that which grows below ground. And if the peculiar structu of the root necessitates the formation of a head, as it is called, it nevertheless the object of cultivation to prevent, as far as possible, th enlargement of this part, and to retain in the greatest degree its natur subterraneous character.

One of the not uncommon modes of growing beets, as distinguish from flat culture, consists in planting on ridges, that is, on strips earth thrown up or raised. This is founded upon the idea that the be will thus be furnished a large quantity of fertile soil and of availab nutriment; that, in addition, the sun imparts more heat to these ridge and that growth is accelerated; and finally, that in wet seasons, or moist situations, the water is absorbed quickly, and the beets are th preserved from injury by excess of moisture. This latter beneficial effe of ridge culture, proves of value, however, in the improved quality the beets, only upon low lands; on high-lying soils, with permeable su soils, equally good results, under conditions otherwise similar, a attained by flat culture. I examined, in eighteen hundred and sixt one, beets grown at Kozaro, in southern Russia, upon high-lying groun under both methods of cultivation. In both cases the juice contain upon the average, 14.8 per cent Balling, and 11 per cent sugar, and therefore 74 parts of sugar in 100 parts of the solid matter. The results of the two methods of cultivation upon a low-lying (acid) peat soil, were entirely different. Flat culture produced a juice of 11.7 per cent Balling, and 6.7 per cent sugar, and therefore having in 100 parts of its solid substance 59 parts of sugar; ridge culture, on the other hand, gave a juice of 15 per cent Balling, and 10.9 per cent sugar, thus containing 75 parts in 100 of the solid substance. In such soils, therefore, ridge culture may be productive of very good results.

If, at the conclusion of this chapter, we glance backward over the whole routine of beet culture, we must, after all, confess that we have, as yet, discovered very few of the conditions which are effective, under all circumstances, for the production of sugar beets containing the greatest quantity of sugar and the least of saline constituents. Beets containing sixteen to eighteen per cent of sugar must still be classed as exceptions. But why should not the exceptions at last become the rule? To insure the production of such beets, independent of accidental circumstances, by accurate investigation of the conditions necessary for their growth, and thus to remove the difficult point in the production of sugar, is the first problem of the beet-sugar industry; and for its solution, the first steps in the right direction have only recently been taken.

The other problem of the beet-sugar industry remaining to be discussed, that of converting into merchandise the sugar produced in the beets by cultivation, is much simpler; and we are very much nearer its solution, since the conditions of the extraction of the sugar have been studied longer and more thoroughly, and are, therefore, much more generally recognized and applied than those affecting the production of sugar from the soil.

ON JUDGING OF BEETS, AND THEIR VALUE DEPENDING UPON THEIR COMPOSITION.

To an expert, a slender, pear-shaped form is the very first indication of a good beet; although Leplay affirms that forked beets are usually richer in sugar(?). The leaves often differ very much, and many experienced persons claim to be able to judge of the quality of the beet by the character of the outer leaves; while they consider crisp and indented inner leaves an especially favorable indication. I have, indeed, often seen cases in which this mode of judging proved correct; but the shape of the leaves depends entirely upon the character of the soil in which the beet grows, and can certainly afford no indication by which inexperienced persons may be enabled to determine its quality. The size of the "head," or green part of the beet above the ground, also affects its value for sugar manufacture. This part not only contains less sugar, but, also, a less pure juice, of such quality that its diminished yield of sugar is extracted at greater expense, because it not only contains a larger quantity of foreign substances, but, also, foreign substances of a different character. It is known that the head of the beet contains, besides potash, a larger proportion of soda than the other parts of it. A fine white skin, narrowness of the concentric rings (which, according to Schacht, should have a width of one eighth to one fourth of an inch), solid, white flesh, a taste but slightly saline, or the evident preponderance of sweetness, afford other perceptible indications by which an approximate estimate of the quality may be formed. For an accurate determination of value, however, it is necessary to determine fully, by scientific methods, the chemical composition of the beets, as well as the sugar contained in them, and the nature and quantity of the foreign substances present with it.

If beet juice were a simple solution of sugar, the extraction of the sugar from it would be equally simple and inexpensive; for the mere evaporation of the saccharine solution, practicable in any household, would be all that would be required to effect the crystallization of the sugar; and we should, in this case, scarcely need the large and expensive establishments, in which the employment of much intelligence and capital is necessary for the separation from the juice of the foreign substances; that is, of all the solid substances that it contains which are not sugar, in order that they may not prevent crystallization. What a decided effect these salts have in preventing crystallization is shown by the fact that one part, by weight, of caustic potash prevents the crystallization of nine times its weight of sugar. Nitrogenous substances in the juice are even more injurious; because, by promoting fermentation of a viscous and frequently vinous, or lactic, character, they induce the conversion of crystallizable sugar into grape sugar.

In practice, therefore, the value of beets is, in general, determined not only by the absolute percentage of sugar contained in them, that is, by the sugar contained in one hundred parts of the juice, but, also, by the relative proportion of sugar; that is to say, by the quantity of sugar in one hundred parts of the solid matter contained in the juice. The latter result is what is known as the Balling's sugar quotient.

The absolute percentage of sugar is determined by the polarization process; the relative, by the proportion which this result bears to the amount indicated by the saccharometer. The quantity of solid matter in the juice is ascertained by the immersion of the tube of the saccharometer (Balling's or Brix's), which gives the percentage, perhaps not with absolute correctness, but without any material error.

The Balling's sugar quotient may also be obtained as follows: If we have a juice of a density of 15.2 per cent by Balling's saccharometer; that is, containing 15.2 per cent of solid matter, as against 11.8 as the result of the polarization process, there are, then, in one hundred parts of solid matter (15.2: 11.8:: 100: 77) seventy-seven per cent of sugar and twenty-three per cent of foreign substances. The number seventy-seven is the Balling's sugar quotient, or quotient of purity, directly expressed, without the one hundred by the fraction $\frac{11}{15} \cdot \frac{8}{2} = 0.77$.

This number, the knowledge of which is of the greatest importance in ascertaining the value of the beet, refers always to one hundred parts of juice, not one hundred parts of beets. The quantity of juice in beets amounts, usually, to ninety-five or ninety-six per cent of their weight, and is easily ascertained by lixiviating a weighed quantity of finely sliced beets with sufficient water, and weighing them again after drying.

Experience has shown that beet juice must have an average purity of at least seventy-five, in order to be profitably manufactured under existing conditions. It varies in practice from ninety to sixty-six, and lower. From these may be seen the importance of this quotient as a measure of the value of the juice; since, for example, with a juice containing ten per cent of sugar and of eighty-seven purity, the value of the beets is five silver groschen, ten pfennigs; whereas, with a juice containing the same percentage of sugar, but only seventy pure, the actual value is only one silver groschen, eight pfennigs, under conditions otherwise similar. Since, therefore, the beet juice in the first place tested 6.4° Beaumé, and in the second 8°, it is evident that the quality of beet juice is never to be estimated by its density, that is, by the quantity of solid matter it contains. I have known cases in which, from a juice of 9° Beaumé, less hard sugar was obtained than from a juice of 7° Beaumé, on account of the former containing a much larger quantity of foreign substances. On lands imperfectly tilled (in Russia and Hungary, for example), such cases are not infrequent.

To find the purity of beet juices, and of saccharine solutions in general, by the polarization instrument, there should be provided a tube of twelve per cent B. = 1.0488 specific gravity (which Schmidt, of Berlin, and Lenoir, of Vienna, supply of sufficient accuracy). The beet juice to be tested is to be diluted to exactly the same specific gravity; and then (after treatment with acetate of lead, on account of which an addition of ten per cent is to be made to the results obtained) subjected to examination in the polarization instrument. Pure, refined sugar, at a density of 1.0488 (the half of 1.1 Ventzke), causes a deviation of 50°, equivalent to 100 per cent, or absolute purity, in a solution of double density. The less the deviation the less the proportion of sugar in the solid matter. Molasses, for example, shows 22½° deviation, which × 2 = 45 per cent of sugar as its quotient. This method is especially applicable to beet juice in the various stages of its treatment in the manufactory, and the result obtained by it is termed "Ventzke's sugar in 100 solid parts."

The method first described for ascertaining the percentage of sugar, that is to say, the sugar in one hundred parts indicated by the saccharometer, is in no case entirely accurate; since the readings of the Brix and Balling saccharometers indicate the percentage of sugar in pure solutions only; and thus, on account of their higher specific gravity, indicate a larger percentage for the salts contained in the juice than the actual amount warrants. The following readings of the saccharometer, due to one per cent of the several salts and acids mentioned, were obtained in experiments made by Gerlach and myself:

SOLUTION OF ONE PART OF EACH SUBSTANCE IN NINETY-NINE PARTS OF WATER.	ACCORDING TO WALKHOFF.		ACCORDING TO GERLACH.	
	Per cent shown by Balling's or Brix's........	Specific gravity....	Percentage, Balling	Specific gravity....
One per cent carbonate of potash........	2.15	1.0086	2.285	1.00914
One per cent caustic potash........	2.2	1.0088	....	....
One per cent caustic potash, neutralized by muriatic acid........	2.6	1.0104	....	....
One per cent caustic potash, neutralized by phosphoric acid........	3.9	1.0156	....	....
One per cent nitrate of potash........	1.55	1.0062	1.602	....
One per cent caustic potash, neutralized by citric acid........	2.75	1.0110	....	....
One per cent sulphate of potash........	2	1.0080	2.050	....
One per cent carbonate of soda (of commerce)........	2.1	1.0084	2.625	1.01050*
One per cent phosphate of soda........	1.1	1.0044	....	....
One per cent common salt........	1.75	1.0070	1.812	1.00725
One per cent nitrate of soda........	1.57	1.0063	....	....
One per cent sulphate of soda (of commerce)........	1.00	1.0040	2.277	........*
One per cent phosphoric acid........	1.00	1.0040	....	....
One per cent oxalic acid........	0.96	1.0038	0.98	....
One per cent magnesia........	1.1	1.0044	2.517	....
One per cent saltpeter........	1.58	1.00635	1.6	1.00641
One per cent chloride of lime........	....	....	2.131	....
One per cent chloride of potassium........	....	....	1.625	....
One per cent sal ammoniac........	....	....	0.787	....
One per cent chloride of magnesium........	....	....	2.112	....
One per cent tartaric acid........	....	....	1.000	....

* Pure.

The saccharometer, therefore, with most acids, indicates a larger percentage of solid matter than the solution actually contains. The difference of 3.4 per cent (between 15.2 and 11.8) resulting in our example of determining the foreign matter must, therefore, be reduced by an amount corresponding to the smaller actual content in order to indicate the real quantity of foreign matter.

In the second part of this work, I assume that, upon the average, 1.6 per cent of the saccharometer correspond to one per cent of salt actually present in the solution. Since, however, besides salts, nitrogenous substances are also contained in beet juice, I am of the opinion, in which I am confirmed by actual experiments made in 1858 (see my "Notes of Travel"), that 1.25 per cent to 1, ought to be taken as the formula of reduction. Bádal arrived at a similar conclusion. It is impossible, however, to establish a formula absolutely correct in all cases, on account of the great variety of foreign substances contained in different beets; and we can only ascertain the actual quantity of matter (that is, the resulting dry residuum) contained in beet juice by evaporating a quantity of juice previously weighed (Otto Bádal).

If we assume that during this evaporation no decomposition of the beet juice takes place, the entire amount of solid matter contained in the juice, in this case 14.75 per cent (instead of 15.2) will be ascertained more accurately than by the saccharometer, and this beet juice would thus have an actual purity of $11.8\times 106\div 14.75=80$ parts of sugar in 100 parts solid matter, whereas that first obtained, the "apparent" purity, was seventy-seven in 100. Notwithstanding it being only approximately correct, we shall in this work take the apparent purity as a basis of all our calculations, since it is the usual custom simply to ascertain this and to calculate by it. Having, then, calculated correctly the quantity of foreign substances, we next inquire how much of this is nitrogenous matter, how much saline, and what are these saline substances. The proportionate quantities of saline and nitrogenous matters are more easily ascertained approximately by methods to be hereafter described, than the character of the salts, the qualitative determination of which always requires an accurate chemical analysis. It is plain, however, that the kind of salts contained in solution is of great importance in practice, since, according as they vary in composition, they are absorbed in very unequal degrees by animal charcoal, as I first showed in eighteen hundred and sixty-one. Some salts, for instance, are not absorbed at all, while of others as much as thirty per cent may be separated from the animal charcoal; the former are therefore of far more injurious effect in the process of manufacture, and should be more carefully avoided than the latter. The value of beets is therefore to be estimated, not only by the quantity of the saline matters contained in the juice, but even in a greater degree by their quality, just as the value of a manure does not depend upon the quantity of the salts, which by its means are supplied to the beet, but upon their character, whether readily or with difficulty to be taken up by the root. Thus Dr. Paul Bretschneider maintains (Journal of the Beet Sugar Industry, vol. xi, page 576) "that with regard to the ash of beets, first, stable manure and next phosphate of lime, produced beets yielding the most ash, while nitrate of soda, which has always been in bad repute with sugar manufacturers as having the effect of producing beets that were difficult to work, gave beets with the least quantity of ash. If we examine further the numerous different combinations which result from nitrate of soda, we shall be led to the conclusion that even these give no confirmation to the opinion entertained by many manufacturers with regard to beets that have been manured with soda."

Dr. Bretschneider undoubtedly judges correctly as a beet grower; the manufacturer, however, will not agree with this usually very accurate author, and for this reason, that of the 0.726 per cent of salts present in the juice, principally in the form of combinations of soda, he is unable to remove any part, either by clarification with lime or by filtration, and in consequence the beets are very difficult to work. On the other hand, it is easy for him to remove, partly by lime, partly and to a great extent by filtration, about thirty per cent of the 0.782 per cent of salts occurring in the beet in consequence of manuring with phosphate of lime. There is left, therefore, only ($70\times 0.782=$) 0.547 per cent to give any trouble, decidedly less than in the case of nitrate of soda, and the manufacturer rightly considers the beet juice of good quality.

The injurious effect of this 0.7 per cent of salt is, however, greater or less, according as it contains more of soda or more of potash. Potash is estimated to render four parts of sugar uncrystallizable, and soda eleven parts. If we assume, then, that in the 0.7 per cent of ash there is 0.4 per cent of potash and 0.1 per cent of soda, there will then be:

$0.4\times 4=1.6$ and
$0.1\times 11=1.1$

Total, 2.7 parts of sugar rendered uncrystallizable. If, on the other hand, the ash contained 0.2 per cent of potash and 0.3 per cent of soda, there would then be:

$0.2\times 4=1.8$ and
$0.3\times 11=3.3$

Total, 4.1 parts of sugar uncrystallizable. And in most cases the soda will preponderate in beets manured with nitrate of soda, according to the quantity applied.

Such facts, if only approximately correct, clearly indicate to the beet grower the necessity of applying, as fertilizers, only such compounds as do not prevent the crystallization of sugar. And by frequent trials he may assure himself of the effect of different salts, from the difference of the value of the beets, according as one or other of them occurs in the largest proportion.

Dr. Grouvens, in his "Contribution to the Science of Manuring" (part 87 of the Journal of the Beet Sugar Industry, page 64), a work which in other respects it is difficult to value too highly, asks: "Who, then, of the sugar boilers, who are so ready to form an opinion, can usually, or in any case, determine the quantity of salts contained in a juice with the exactness necessary to a judgment of its value?" And this question is characteristic of the position of those who take into consideration only the quantity of salts, or rather of ash. It is not, however, the percentage of salts that is alone of consequence, but also the proportion of them that may be separated. This the agricultural chemist, who engages in experiments with reference to beet culture, should never forget; and so long as this is not taken into account, it is but right that he should pay some respect to the experience of the sugar refiners, when they say, for example, that such beets as contain nitrates work badly.

We come now to the consideration of the composition of the beet in its details. And so various is it, as is well known, from a difference of seed, soil, cultivation, manuring, productiveness, and the effects of climate, that the juice may in some cases yield quite white sugar by simple evaporation, while, on the other hand, it frequently justifies the saying, that "a bad beet is too dear if it costs nothing."

The principal constituent of beet juice is sugar, varying in quantity from nine to eighteen per cent, and easily to be determined by the polarization and other processes. No intelligent manufacturer of the present day neglects these indispensable aids. The saline constituents of the beet, the alkalies (potash and soda), the alkaline earths (lime and magnesia), the metallic oxides and refractory acids which it contains, can best be determined by evaporating one thousand grains of beet juice to dryness in a platinum capsule, and heating the residue until the incineration is complete. In the operation, it is necessary to be careful not to raise the temperature too quickly to the melting point. Fresenius recommends placing a common lampglass over the capsule for the promotion of a current of air. Balling successfully employed a constant, gentle current of air, produced by water pressure. An occasional sprinkling with distilled water promotes the rapidity of the incineration, but this must be done with the greatest caution, in order that it may not spill over and so render the result doubtful. The ash thus obtained, varies from 0.5 to 1.2 per cent of the beet juice; but affords only an approximate measure of the quantity of salts that it actually contained. The bases contained in the ash are, in the juice, combined partly with organic, partly with inorganic acids to form salts. The organic acids are consumed during the process, and so form a large quantity of carbonic acid, which, for the most part, passes into combination with the alkalies.

Since, however, the vegetable acids constitute a larger portion by weight than the carbonic acid—since, moreover, the alkaline bases that were combined with the vegetable acids weigh less in the free condition in which they partly remain after incineration than while in combination with acids—the weight of the salts contained in the beet juice is always greater than that of the ash obtained from it. The two weights, however, bear to each other a proportion more or less constant, so that it is possible from the quantity of ash obtained to infer the quantity of salts in the juice.

What quantitative proportion, however, the ash bears in any case to the saline constituents, may be difficult to determine. Otto has contributed several papers on the subject, in which he states that for one hundred parts of neutral citrate of potash in the juice, fifty of carbonate of potash, and for one hundred parts of oxalate of potash eighty-three of carbonate occur in the ash.

It has also been proposed to evaporate the juice, to char the residue, and, afterwards, to lixiviate with distilled water, to evaporate the fluid extract and incinerate the dry substance. Surer and more accurate results may thus be obtained. Another plan is to make this extract, which contains all the saline matters in the juice, equal in volume to the quantity of juice taken for examination, and to test it by Balling's or Brix's saccharometer. It may thus be ascertained directly in each case how much of the percentage indicated by the saccharometer for the juice is due to the salts contained in it, and the difference can be computed as due to the proteine and extractive matters (as well as finally for the organic acids of those salts which, by the charring process, have been converted into alkaline carbonates). If, for instance, we have for a sample of beet juice:

15.2 per cent Bg. indicated by the saccharometer, and
11.8 per cent has been ascertained to be sugar, then
3.4 per cent of the saccharometer is due to foreign substances of organic and inorganic origin, and if then the extract obtained by the above method should, for instance, show
2.2 per cent as due to saline matters, there would remain
1.2 per cent for the proteine and extractive substances (assuming that the organic acids in combination remain undecomposed).

This process would be very simple if the charring of the evaporated juice could be effected without decomposition of the salts whose acids are of organic origin. It is evident, however, that these salts will, during the charring process, be for the most part transformed into alkaline carbonates, and that, therefore, the indication of the saccharometer will be too small. In any case, this method can only give approximately correct results, when the charring has been performed with the greatest possible precaution, avoiding too high a temperature, and the charred mass has been completely lixiviated without loss.

The ash of beet juice contains from seventy to eighty parts in one hundred soluble in water, which represent the alkalies that have been or still are combined with various acids; the insoluble residue consists of carbonate and phosphate of lime, magnesia, oxide of iron, sand, etc. (Hochstetter.)

Balling has reduced the percentage of ash, as compared with that of sugar in the juice, to a numerical proportion, which he calls "the salt percentage quotient." Good beets give three parts of ash to one hundred of sugar; if there are ten parts of ash to one hundred of sugar, the beets are very bad for manufacturing purposes.

Proteine substances, albuminous nitrogenous matters, seem to occur in beets in very varying proportions. According to Michaëlis they amount to from four to five thousandths parts of the juice, while Payen, Péligot, Hochstetter and others found in it more than one per cent.

Hochstetter classifies the nitrogenous substances in beet juice as follows:

1. Vegetable albumen, of which more than sixty per cent coagulated by heating, but was somewhat dissolved again by free alkalies.
2. A nitrogenous compound (turning black, according to Michaëlis), which absorbs oxygen from the air and appears as a black substance. By the addition of a salt of lime, for instance chloride of calcium, this matter may be removed from the raw juice.
3. A nitrogenous glutinous substance, removable by lime water.
4. A nitrogenous substance, removable by acetate of lead.
5. Substances removable by bi-nitrate of mercury.

On account of the extraordinary facility with which these substances decompose, they are of the greatest moment in sugar manufacture, as being promoters of putrefactive fermentation, which changes the nature of the sugar, and thus at the same time diminishes and deteriorates the product. A quick and easy method of determining their quantity becomes therefore in the highest degree desirable in the interest of scientific manufacture, since by it we could ascertain, in advance, the quantity of these hindrances to the extraction of the sugar, and apply accordingly the necessary means for their immediate control. Such a process is, however, as yet wanting, and I shall, therefore, in what follows, attempt to make the quantitative determination of them easier in practice.

Proteine substances, as is well known, form insoluble combinations with tannic acid. It is therefore possible, by means of solutions of substances such as tannin, catechu, or nutgalls, containing tannic acid, easily to separate the proteine substances contained in beet juice, and to ascertain their quantity; and upon this property of these substances I base my method.

For this determination we require only a normal solution of one gramme of pure tannin in one thousand grammes of distilled water (one litre). We may, also, employ a solution of ten grammes to one thousand, or of ten to one hundred; but the weaker solution is preferable, because it effects an easier and quicker separation of the precipitate. This solution of one to one thousand is to be dropped, little by little, into a mixture of ten cubic centimetres (or one cubic centimetre) of beet juice, with one hundred cubic centimetres of distilled water and ten cubic centimetres (or one cubic centimetre) of a solution of alum, warmed in an earthern vessel over a spirit lamp, shaking it before each successive addition, so as to effect a complete separation of the precipitate. The tannin very quickly causes a clouding, which, by means of the alum, is rapidly collected in flakes, which, in the weak solution, quickly separate. Usually, so long as there are proteine substances in the juice the tannin will enter into insoluble combinations with them in the form of flakes; but as soon as they are entirely separated by means of the tannin a further addition of the tannin solution will show itself in excess; and the question is to acertain the point at which this separation is complete. This point may be readily ascertained by means of the property of the tannin of producing, with salts of iron, a dark blue color. It is, therefore, only necessary to add, from time to time, with a fine pointed pipette, a drop from the clear solution undergoing separation in the earthern vessel to a drop of a solution of chloride of iron. If no tint appears we must continue to add the tannin solution. Should a color appear, however, it is an indication that the tannin is already present in excess, and that the proteine substances are, therefore, entirely separated.

Since it is important not to take, for the purpose of this test, any of the flaky precipitate (which contains tannin), we may, for greater certainty, as soon as the tinge appears, filter a little of the diluted juice, and test the filtrate again with the solution of chloride of iron, in order to make sure that it is not the tannin of the precipitate, but that present in the solution that produces the color. The operation is in the highest degree simple and quickly performed. The computation is likewise quickly made. Assuming that to ten cubic centimetres of raw beet juice we have added six hundred and seventy cubic centimetres of the solution containing one tenth of one per cent of tannin, this will be equivalent to an addition of six thousand seven hundred cubic centimetres of the same tannin solution to one hundred cubic centimetres of beet juice. One thousand grammes of this solution contain one gramme of tannin; therefore six thousand seven hundred cubic centimetres (= grammes) contain 6.7 grammes, the quantity we have found necessary for the separation of the proteine substances from one hundred cubic centimetres of juice; and since six parts of dry tannin precipitate one part of albumen (reckoned dry), there have been at least $(6: 6.7 = 1: x)$ 1.11 per cent of albumen in the juice, or a quantity of nitrogenous substance nearly equivalent to this quantity of albumen.

Even if the tannin solution does not, perhaps, precipitate all the nitrogenous combinations, it is yet safe to assume that the nitrogen in beet juices is proportioned to the quantity of tannin employed for the precipitation of the proteine substances; and that the more tannin juice requires for the precipitation of its nitrogenous constituents, the worse it will be to work.

Although we have, in what has preceded, taken a rapid view of the more important among the various substances in beet juice, their peculiar properties still remain undefined; and a thorough scientific estimation of the value of beets, as material for the manufacture of sugar, is possible only when based upon accurate, minute analysis; which, however, in practice involve far too much detail, and are, therefore, unadvisable. We, therefore, content ourselves with simple tests, which, with the help of formulas deduced from experience, quickly lead to an approximately safe conclusion as to the quantity of merchantable product.

The quantity of sugar to be obtained from beets was formerly estimated according to the quantity the beets contained. Schatten, for example, at an early day, founded his formulas, which are well known to many readers, upon this assumption, and a large number of manufacturers still hold it; because it has been confirmed by their experience, acquired under similar local conditions, and they have consequently been led to the adoption of similar theories. This apparently reasonable supposition, moreover, held good in certain prescribed districts, in which the beet was of a uniformly good quality, that varied but slightly in different seasons. Comparison of the results obtained in different countries proved, however, that even under precisely similar methods the conclusions were not always correct, and that for a just estimate of the yield to be obtained, still other factors, which evidently largely influence the manufacture, must be taken into account. The difference in the product did not appear so much in the quantity of condensed juice (at the point of crystallization) as in the proportion between the weight of the hard sugar and that of the molasses contained in it, for the condensed juices of beets having the same percentage of sugar, were frequently found to contain these substances, so unequal in their value, in very different proportions. I therefore conjectured that the quantity of foreign matters—that is, of saline and proteine substances—must in every case be taken into consideration in order to an estimate of the product in hard sugar, and *that the quantity of molasses resulting in any case would be in an approximately determinable proportion to the quantity of foreign matters in the raw beet juice*, although the character also of these foreign matters may cause a decided difference in the product of molasses, as has already been established by experience, although the connection has not yet been confirmed and explained by accurate scientific investigation.

In order to determine in advance the yield of sugar from one hundred beets, I first calculated the quantity of condensed juice to be expected, and from this the quantity of molasses which must necessarily result, due to the percentage of foreign substances (which have also been appropriately called molasses-makers) contained in the juice. The product of the molasses had formerly (as Schatten's tables prove) been assumed to be proportional to the percentage of sugar in the juice. I determined it without regard to this, but simply by the extent of the causes inducing its formation. I published my first computations in eighteen hundred and fifty-eight, in the Journal of the Beet Sugar Industry (volume viii), and in my Travels in Bohemia, published at Prague, in that year, and from these they were transferred to other publications without acknowledgment. The essential part may be stated in a few words.

The quantity of foreign substances in the beet juices may evidently, as has been previously stated, be ascertained by the difference between the indication of the saccharometer and the actual percentage of sugar. From this difference we may compute approximately the actual weight of the foreign substances, by means of a formula, to be accertained in accordance with the local conditions existing in the case, as for instance, 1.25: 1.

For example..15.2 per cent Balling.
minus 11.8 per cent sugar.

leaves 3.4 per cent difference.

This 3.4 per cent excess by the saccharometer, at the rate of 1.25: is equivalent to 2.72 per cent of the solid matter in the juice, which i not sugar, but comes under the head of solid substances.

Otto recommended for the reduction of the saccharometer percentag to the actual percentage of solid substance other than sugar, to multipl the former by 0.8, which, in our example, gives the same result, 2.72 pe cent, the two methods being the same, division by 1.25 being equivalen to multiplication by 0.8.

The ratio will, however, vary greatly for beets of dissimilar composi tion, and it will be necessary to have numerous quantitative analyses i which all the constituents of the juice shall be determined, before a rule can be established of general validity and correct in all cases, as to the proportionate quantity of sugar and substances other than sugar in the beet juice, as well as for the proportion between the saline and proteine substances constituting the latter. In equal quantities of solid matter other than sugar obtained from different beets, it is probable that these constituents will occur in very different proportions, and the importance of ascertaining these cannot but be recognized, if we consider how frequently a given percentage of saline matters will cause an entirely different product of molasses from that due to a considerably larger percentage of proteine substances.

The tables which follow give no indication of their separate action, but indicate only the percentage of foreign substances in the juice, and their united effect upon the product of the manufacture in sugar and molasses:

If the difference by the Saccharometer to be taken for computing the foreign substances in 100 parts of juice, be:	The corresponding difference for 100 parts of beets will be:	Which, reduced at 1.25:1, will give as the actual percentage in the beets:
1.5	1.44	1.152
2	1.92	1.536
2.5	2.40	1.920
3	2.88	2.300
3.5	3.33	2.688
4	3.84	3.072
4.5	4.32	3.464

As these differences have actually been observed in practice, it i therefore important that beet growers should bear in mind how small quantity of saline and proteine substances occur in beets in some places how little, moreover, these seem to be promotive of their growth; whil in other places twice and three times the quantity of these substanc have been found in beets.

Still more important will the consideration of these figures appe when we examine the following table, in which we find, approximatel expressed in figures, the effect which the presence of foreign substanc in beets exercises upon the product of sugar.

Taking the yield of juice at eighty-eight per cent, and its percentage of sugar as the same in all cases:

WHEN THE JUICE SHOWS THE FOLLOWING PERCENTAGES BY BALLING'S SACCHAROMETER, DUE TO FOREIGN SUBSTANCES.	THE ACTUAL PERCENTAGES OF FOREIGN SUBSTANCES WILL BE:		Percentage of sugar lost or unobtainable.	Percentage of molasses formed.
	In the juice.	In the condensed juice.		
1.5........................	1.013	0.608	0.536	1.1
2	1.350	0.810	0.820	1.7
2.5	1.689	1.014	1.105	2.2
3	2.027	1.216	1.389	2.8
3.5..	2.265	1.419	1.672	3.4
4	2.703	1.621	1.455	4
4.5........................	3.048	1.829	2.246	4.6

From the consideration of these figures it becomes evident how important it is that the beet grower should aim at the production of beets containing but little saline matter, since from such roots a larger quantity of crystallizable sugar, and less molasses in proportion, are obtained, and that with less difficulty and expense; while the outlay for animal charcoal and the cost of cultivation are both decidedly less when the juice contains less of these substances.

Indeed, many factories have established a reputation simply because they have had a supply of beets of particularly good quality; and it is certain that, with equal skill in method and intelligence in direction, but with inferior material, the results would be entirely different.

When we further consider that juices containing the same percentage of sugar may contain such different amounts of foreign substances, it becomes perfectly clear how it is that, in practice, such different yields of sugar in merchantable form may be, and, necessarily, must be obtained from juices containing precisely the same percentage of sugar, so long as the art has not so far advanced as to enable us to effect the complete separation of the foreign substances without the loss of crystallizable sugar. As an indication of the value of beet juices, however, the quantity of foreign substances agrees exactly with their Balling's "sugar percentage quotient," or "quotient of purity," as is shown in the following tables, which, along with the yield of condensed juice, express in exact numbers the effect of the foreign substances upon the product of sugar and molasses.

These tables show at the same time the actual value of the beets; and the beet grower may learn from them what real differences in profit result from the different methods of cultivation and the application of different manures; and, by logical deduction from the facts, connecting the effects with the causes (to be found in the method of cultivation), he can convince himself how, under the most favorable conditions—whether bestowed by nature, or only achieved by labor and skill—he may not only produce more beets and more sugar, but, at the same time, less of saline substances, and thus obtain the highest actual value, and since the price paid by the manufacturer is always based upon the real value, the highest return of net profit.

Tables such as these, of the yield of the manufacture, afford, therefore, the only means of judging correctly as to the fitness of any beets for the production of sugar. (1)

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(1) Referring to the following tables.

It is assumed in these tables that:

One pound of sugar, at 3.3 Sgr. = per one hundred pounds, eleven Prussian thalers.

One pound of sugar, at twenty new kreutzers, = per one hundred pounds, twenty Austrian florins.

One pound of sugar, at 12.5 silver kopecks, = per pood (forty pfund), five silver roubles.

One pound of molasses, at 2.4 pfennigs in Prussia.

One pound of molasses, at one new kreutzer in Austria.

One pound of molasses, at one quarter kopeck in Russia.

While the expenses are assumed to be:

Seventeen silver groschen per centner in Prussia.

Ninety new kruetzers per centner in Austria.

Two silver roubles, fifty kopecks, per berkobetz of four hundred pfund in Russia.

TABLE I,

Showing the product per cent from beets of different qualities, the juice containing nine per cent of sugar by the polarization process, and the yield of juice assumed to be eighty per cent in each case.

THE DENSITY OF THE JUICE BEING		Per cent by Balling's saccharometer, due to foreign substances	Quotient of purity, per cent	CONCENTRATED JUICE.				CANE SUGAR AT 94 PER CENT.		Molasses, per cent........	RESULTING VALUE OF THE BEET.					
					CONSISTING OF						PER 100 POUNDS.			PER 1 BERKOBETZ.		
											PRUSSIAN.		AUSTRIAN.	RUSSIAN.		
Degrees Beaume...	Per cent Balling....			Total percentage,	Sugar	Foreign substances.	Water......	For 100 pounds of beets.......	For 100 pounds of concentrated juice......		Sgr.	Pfg.	Nkr.	Pfd.	S. R.	Kop.
5.8	10.5	1.5	85.7	7.436	6.48	0.553	0.703	6.18	80	1	3	6	34	24.7	....	59
6.1	11	2	81.1	7.938	6.48	0.737	0.721	5.81	73	1.5	2	6	27	23.5	....	40.5
6.35	11.5	2.5	78.2	8.142	6.48	0.922	0.740	5.64	70	2	2	....	24	22.5	....	32
6.6	12	3	75	8.344	6.48	1.106	0.758	5.37	64	2.5	1	3	20	21.5	....	18.5
6.9	12.5	3.5	72	8.547	6.48	1.290	0.777	5.13	60	3	....	6	15	20.5	....	6.5
7.2	13	4	69.6	8.799	6.48	1.424	0.795	4.89	56.5	3.6	....	5	7	19.5	....	5.5
7.5	13.5	4.5	66.6	8.957	6.48	1.663	0.814	4.55	50	4.2	....	3	1.4	18.2	....	22.5

TABLE II,

Showing the product per cent from beets of different qualities, the juice containing ten per cent of sugar by the polarization process, and the yield of juice assumed to be eighty per cent in each case.

THE DENSITY OF THE JUICE BEING		Per cent by Balling's saccharometer, due to foreign substances	Quotient of purity, per cent......................	CONCENTRATED JUICE.				CANE SUGAR AT 94 PER CENT.		Molasses, per cent........	RESULTING VALUE OF THE BEET.					
				Total percentage.	CONSISTING OF			For 100 pounds of beets........	For 100 pounds of foreigu substances..........		PER 100 POUNDS.			PER 1 BERKOBETZ.		
					Sugar......	Foreign substances.	Water......				PRUSSIAN.		AUSTRIAN.	RUSSIAN.		
Degrees Beaume...	Per cent Balling....										Sgr.	Pfg.	Nkr.	Pfd.	S. R.	Kop.
6.4	11.5	1.5	87	8.528	7.2	0.553	0.775	6.87	80	1	5	10	48	27.5	....	93
6.6	12	2	83.3	8.730	7.2	0.757	0.793	6.6	75.6	1.53	5	1	34.5	26.4	....	80
6.9	12.5	2.5	80	8.934	7.2	0.927	0.812	6.4	72	2.06	4	9.6	41.6	25.6	....	70
7.2	13	3	77	9.202	7.2	1.166	0.836	6.2	66	2.5	3	10	36.5	24.8	....	60
7.45	13.5	3.5	73.3	9.339	7.2	1.290	0.849	6	64	3.1	3	4	33	24	....	50
7.7	14	4	71.4	9.5	7.2	1.474	0.867	5.6	59.8	3.6	2	2.6	26.8	23	....	37.5
8	14.5	4.5	70	9.74	7.2	1.663	0.886	5.4	55	4.2	1	8	22.2	21.6	....	20

TABLE III,

Showing the product per cent from beets of different qualities, the juice containing eleven per cent of sugar by the polarization process, and the yield of juice assumed to be eighty per cent in each case.

THE DENSITY OF THE JUICE BEING		Per cent by Balling's saccharometer, due to foreign substances	Quotient of purity, per cent	CONCENTRATED JUICE.				CANE SUGAR AT 94 PER CENT.		Molasses, per cent........	RESULTING VALUE OF THE BEET.					
				Total percentage.	CONSISTING OF			For 100 pounds of beets.......	For 100 pounds of concentrated juice		PER 100 POUNDS.			PER 1 BERKOBETZ.		
					Sugar......	Foreign substances.	Water......				PRUSSIAN.		AUSTRIAN.	RUSSIAN.		
Degrees Beaume...	Per cent Balling....										Sgr.	Pfg.	Nkr.	Pfd.	S. R.	Kop.
6.4	11.5	1.5	87	9.3	7.92	0.553	0.847	7.96	82.3	1	8	....	63	30.6	1	33
6.6	12	2	83.3	9.5	7.92	0.737	0.865	7.38	77.7	1.5	7	5.6	59	29.5	1	18.7
6.9	12.5	2.5	80	9.7	7.92	0.922	0.884	7.12	74	2	6	9	54	28.5	2	....
7.2	13	3	77	9.9	7.92	1.106	0.902	6.85	69	2.5	6	....	49.5	27.4	....	92
7.45	13.5	3.5	73.3	10.13	7.92	1.290	0.92	6.58	65	3	5	1	44.6	26.3	....	78.7
7.7	14	4	71.4	10.33	7.92	1.474	0.939	6.32	61	3.6	4	6	40	25.3	....	66.3
8	14.5	4.5	70	10.53	7.92	1.663	0.958	6.05	57	4.2	3	8	35	24.2	....	52.5

TABLE IV,

Showing the product per cent from beets of different qualities, the juice containing twelve per cent of sugar by the polarization process, and the yield of juice assumed to be eighty per cent in each case.

The density of the juice being		Per cent by Balling's saccharometer, due to foreign substances	Quotient of purity, per cent	Concentrated Juice.				Cane Sugar at 94 per cent.		Molasses, per cent........	Resulting Value of the Beet.					
				Total percentage.	Consisting of						Per 100 Pounds.			Per 1 Berkobetz.		
											Prussian.		Austrian.	Russian.		
Degrees Beaume...	Per cent Balling....				Sugar......	Foreign substances.	Water......	For 100 pounds of beets........	For 100 pounds of concentrated juice......		Sgr.	Pfg.	Nkr.	Pfd.	S.R.	Kop.
7.45	13.5	1.5	89	10.1	8.64	0.553	0.919	8.396	83	1	10	10	78.9	33.6	1	70
7.7	14	2	85	10.3	8.64	0.737	0.937	8.231	79.8	1.5	10	3.6	76	32.9	1	61.2
8	14.5	2.5	82.8	10.5	8.64	0.922	0.956	7.86	74.8	2	9	....	69	31.2	1	40
8.3	15	3	80	10.7	8.64	1.100	0.974	7.59	70	2.5	8	6	64	30.4	1	30
8.5	15.5	3.5	77.8	10.9	8.64	1.290	0.980	7.33	67.2	3	7	9	59.	29.2	1	15
8.8	16	4	75	11.1	8.64	1.474	1.010	7.08	63	3.6	6	9	55	28.3	1	0.30
9	16.5	4.5	72.1	11.3	8.64	1.663	1.030	6.78	60	4.2	6	....	49	27.2	....	97

TABLE V,

Showing the product per cent from beets of different qualities, the juice containing thirteen per cent of sugar by the polarization process, and the yield of juice assumed to be eighty per cent in each case.

The density of the juice being		Per cent by Balling's saccharometer, due to foreign substances	Quotient of purity, per cent........................	Concentrated Juice.				Cane Sugar at 94 per cent.		Molasses, per cent........	Resulting Value of the Beet.					
				Total percentage.	Consisting of						Per 100 Pounds.			Per 1 Berkobetz.		
											Prussian.		Austrian.	Russian.		
Degrees Beaume...	Per cent Balling....				Sugar......	Foreign substances.	Water......	For 100 pounds of beets........	For 100 pounds of foreign substances..........		Sgr.	Pfg.	Nkr.	Pfd.	S.R.	Kop.
8	14.5	1.5	89.6	10.8	9.36	0.553	0.991	9.14	83.8	1	13	2.4	93	36.6	2	07
8.3	15	2	87	11	9 36	0.757	1.009	8.87	79	1.5	12	4	89	35.5	1	93
8.6	15.5	2.5	84	11.3	9.36	0.922	1.028	8.58	75.9	2	11	8	83	34.3	1	79
8.87	16	3	81	11.5	9.36	1.100	1.046	8.34	72.5	2.5	11	....	79	33.3	1	67
9	16.5	3.5	78.18	11.7	9.36	1.290	1.065	8.17	69.9	3	10	6	76	32.7	1	58.5
9.4	17	4	76.4	11.9	9.36	1.474	1.083	7.71	65	3.5	9	....	68	30.8	1	35.5
9.6	17.5	4.5	74	12.1	9.36	1.663	1.102	7.50	62.4	4.2	8	6	64	30	1	25

MEANS OF DESTROYING INSECTS INJURIOUS TO BEETS.

The little beet plants are exposed, especially during the earliest period of their growth, to injury by multitudes of insects. The sweet, agreeable flavor of the tender plant seems to be attractive to so many species, that their number is much too large to enumerate them here, or to describe them in their different stages of existence, and I must confine myself to the mere statement of the means hitherto employed to restrain their ravages.

These consist, first, in capturing, gathering, or catching the insects, a method especially to be recommended for the snout beetles, which are found in such multitudes in many districts. One plan is for a row of children to pass over the whole field, putting the beetles which they may find into tin boxes made for the purpose, having a small opening from which they cannot escape; another is to encompass the whole beet field with a narrow trench, having steep sides, in which the beetles may be taken. These insects never fly, but frequently, when the wind conveys to them the attractive odor of the beet field, move in troops over the ground toward it, and thus collect in the trenches, in which holes sunk at short intervals facilitate their collection. In this way a great quantity of beetles may be destroyed, and the damage they would do prevented.

Count A. Bobrinsky has, besides, for catching winged insects, constructed a machine, which consists of a wire net balanced upon two wheels and easily drawn over the ground. The insects are captured and collect in the upper convex portion of the net, and are there destroyed by kindling a fire of straw or similar material.

Mr. Edward Kutzer, of Dürnkrut, has devised a machine in which the insects are to be caught by means of tar, and then scraped off and destroyed.

Grubs also (the larvæ of the May beetle) do much damage to beet plants by eating off the ends of the roots. They may be collected in the furrows, by children following the plow, and destroyed. Districts in which grubs abound require, on this account, an additional plowing in the Spring, by means of which a portion of these injurious insects will be brought to view, and thus may be captured.

These grubs are white, but when exposed to the sun turn black and die. They crawl under ground from plant to plant and eat the roots, so that the leaves begin to wither and turn yellow. If a particular spot be infested while the rest of the field is unaffected, their further progress may be prevented by drawing a ditch two feet deep around the infested portion and filling it with leaves. This forms a barrier which the grubs cannot penetrate.

Although the most effectual means of insect extermination consist in the employment of the human hand, there exist in nature many enemies of these pests, by whom we are aided in this war of extermination. Many kinds of birds, the mole, etc., are the ever watchful and efficient destroyers of large numbers of insects.

It has been recommended to sprinkle both the seeds and plant with flowers of sulphur, and brushes with long bristles have been drawn between the rows, so as to knock the insects from the leaves, after which they may be easily destroyed by strewing caustic lime between the rows. Bright lanterns, with strong glasses smeared with oil, have also been used in the evening for catching moths, which fly to the light and

remain stuck fast. It has been stated that with two hundred lamps, fifty-three thousand six hundred and sixty moths have been caught in two hours.

Another way of protecting the young beet plants from destruction by vermin consists in sowing between the rows another plant of quicker growth or more attractive to the insects, and which may afford to the voracious little pests abundance of agreeable food, and thus give the young beet plants time to grow. Mustard is especially adapted for this purpose, as are orach (for the larvæ of the *Cassida nebulosa*) and other plants of a similar character. To this plan it has been objected that it feeds the insects and favors their increase; but it seems to me far better that they should regale themselves on other leaves than those of the beet, and we are not in this case at all prevented from employing the means that have been recommended for the destruction of the vermin. At all events, this method can only be efficacious under certain circumstances and in certain localities, and it must be left to the judgment of the beet grower to determine what are the most suitable means in any case for the destruction of insects, or how to protect his beet plants so that he may not be obliged to sow a second time.

The third means of protecting the beets is the simplest and most practical, and is in very general use. It consists simply in the way o sowing. By sowing abundantly in clusters we obtain a sufficient quantity of plants to afford a liberal supply for the insects, and accomplish the same end as is sought by the method just stated of planting another crop between the rows.

The greater distance between the separate bunches of plants, when sown in this way, prolongs the passage of the insects from one bunch to another; while the juxtaposition of the plants, when sown in drills makes it easy for them to crawl from plant to plant, and a rapid spread of the insects is the result. Besides, the sowing in bunches promotes as has been already observed, the growth of the plants to such a degree that the luxuriant foliage is soon enabled, by its very quantity, to withstand the assaults of vermin; and, at any rate, total destruction is prevented. We have already, in the chapter on sowing, fully explained how the vigorous growth of the young plant may also be induced by other means; for instance, by soaking the seed in liquid manure, by applying bone dust with the seed, etc. It is also advantageous to sow early; because the plants begin to germinate at a comparatively low temperature of the soil, and so quickly grow away from the insects which do not become active until later, when the ground has become warmer. That soaking in urine and the application of fertilizers with the seed afford a direct protection from attack, besides quickening the growth, has also been previously explained. Cow dung is not to be recommended as a manure, for the reason that it generally harbors numerous insects, which are conveyed with it to the land.

Until a more accurate, scientific investigation of the subject of insect life shall furnish us better means of defense, we must be content with those that have been now recounted.

SEED GROWING.

Every plant grows from the seed, and retains the character which i has itself imparted to it. Of beets, especially, there are numerous varieties which reproduce themselves from the seed without change, as for instance, the red turnip beet, the yellow, round-rooted beet, the mangolds and sugar beets in their numerous varieties. The manufacturer is, of course, interested in the production or selection of good beet seed as one of the essentials of skillful and profitable management. It has, therefore, long been an object of concern, in all countries in which the beet sugar industry has become established, to select carefully for the production of seed the beets containing the most sugar, in order to transmit this valuable quality to the succeeding crop. The judicious selection of the beets containing the most sugar is, however, always attended with more or less difficulty.

In many cases the leaves of the beet, while still in the field, in the month of October, afford an approximately safe indication of the quality of the root. Every observing beet grower has had abundant opportunity of noticing the variety in the formation of the beet plant, which frequently indicates an equally wide difference in the character of the root.

The signs by which experts will in this way distinguish the richest beets are, however, different in different districts and countries; and no definite rule can, therefore, be given, applicable to all cases, by which the best beets may be selected; and hence Leplay would seem to have concluded that the leaves in general afford no indication by which to decide as to the quality of the beet. The assertion, however, seems to me to go too far, since a difference of leaf formation ought, as a natural consequence, to indicate a somewhat changed constitution of the plant; and the question only is what leaf formation belongs to the sweetest beets.

In Magdeburg, they consider few, flat, recumbent, roundish leaves a sign of a good beet. In South Russia, on the other hand, an experienced person pointed out to me the indented, wavy, bright green, young heart leaves as a sure sign by which, in that particular district, he was accustomed to pick out the best beets. Several trials showed, in fact, that the juice of beets so selected was 1° B. denser than the juice of beets of different leaf formation grown on the same piece of ground.

From this it seems to result that greater attention to this point is capable of affording fair indications as to the quality of the beet, which must then, for greater certainty, be modified and established by other tests.

The intelligent seed grower can in this way, before harvesting the beets, select such specimens as, from their leaf formation and the slight projection of the top above the ground, are presumably of good quality. These beets should then be carefully taken up, and, after the leaves have been cut off an inch above the crown, tested as to their specific gravity, and their goodness thus determined.

The proportion between the specific gravity and the quantity of sugar in the juice is, however, exceedingly variable, depending upon the soil, cultivation, manuring, etc., and it is, therefore, not advisable to proceed to the selection of seed beets before determining that this proportion is such as to show the beets to be of suitable quality for manufacture. The sugar percentage quotient, as it is termed, by which this proportion is expressed, should, as experience proves, not fall under seventy-five; that is to say, out of one hundred parts per cent indicated by the saccharometer, at least seventy-five should be due to sugar. If the quotient, even with a higher specific gravity, be found to be less, we may better not use, for seed growing, beets containing such a quantity of salts.

For ascertaining the specific gravity, Vilmorin has proposed to bore each beet through at right angles, about the middle, with a little tool designed for the purpose; to grind and press the piece thus obtained, and to test the resulting juice at a prescribed temperature by means of a small but delicate instrument.

Vilmorin classes as good beets those that have a juice of a specific gravity of 1.060 to 1.075, corresponding to from fifteen to eighteen per cent Balling. If still higher the beet is so much the better, provided the sugar percentage quotient is larger in the same proportion. The beets proved by this test to be suitable for seed may then be stored, after filling with dry sand the holes that have been bored in them.

Sullivan proposed in like manner to test the specific gravity of all the roots, since a high specific gravity indicates not only the presence of much solid matter in the juice, but also a dense texture of the root, which is usually regarded as a sign of a good sugar beet. It is sufficient for this purpose to make a brine of, for instance, a specific gravity of 1.060=15 per cent Balling or Brix, and to retain all the beets which sink in this as fit for seed growing, and to consign to the factory all that float.

Since extensive experience seems to prove that the peculiarity of high specific gravity, or of richness in sugar, is capable of perpetuation in beet roots, the methods that have been stated for selecting good roots for seed are of special importance to the sugar manufacturer, since they may enable him to effect an improvement in the plant, or, at least, to prevent its degeneration, which is so liable to occur and so difficult to check.

For keeping these selected beets, they should be laid separately and with regularity, and each row lightly covered with earth, so that the layers may be kept apart. A heavy outer covering of earth, and, if necessary, an extra covering with manure, protects them from frost, and they are planted early in April on warm and dry land, which must be just as carefully prepared as for the beet crop of the first year.

As nitrogenous manures not only retard the ripening of the seed, but cause it to be very irregular, their use should be avoided for seed beets; for manuring which, bone dust or superphosphate of lime is most to be recommended, as supplying an abundance of phosphoric acid, which is essential to the production of seeds.

The beets for seed are planted in squares of two or three feet, partly in order to permit the full effect of the sun, partly because essential to the vigorous growth of the plant. Many prefer putting the roots one inch deep in the ground obliquely, at different angles, in order that the plants may grow up at different angles in such a way as to be better able to withstand the wind, and so that fewer of the seed branches will require tying up to stakes. In any case, however, it is advisable to inclose the entire field with stakes and straw ropes, since otherwise a strong wind will be likely to cause damage.

Special care is also to be taken that no fodder beet seed is grown in the neighborhood; since, in that case, the wind might cause a mixture of the species, and the quality of the sugar beets might be greatly impaired. (Knauer.)

That the beets planted for seed must be as carefully hoed as the beets in the first year is plain from the nature of the case, since the less nutriment is withdrawn from them by weeds the more vigorously will the plants grow.

The seed shoots of the beet quickly attain their height and often put out numerous branches. The ripening of the seeds is to be recognized in the field by the brownish color of the tips.

The ripe seed stems are cut above ground with a sickle or similar instrument, cured in strong sun heat, and thrashed or trodden out, if possible in the field, large sheets of common linen being spread for the purpose.

The cleaning of the seed from the adhering little stems of the seed branch is somewhat difficult, but is easily effected with a good cleaning machine; it is necessary and profitable, because the subsequent sowing with the machine can be done more easily and uniformly the cleaner the seed is.

The fresher the seed when sown, the more quickly and completely will it germinate. As it becomes older it loses more and more in both these respects. Thus, one-year-old seed comes up more quickly and with fewer missed places than seed two years old, and so on.

The quickest possible use of beet seed is also advisable, because the mice have a great fondness for it, and therefore are apt to diminish its quantity not a little. The best way of keeping it is in bags, hung up in a well ventilated loft. (Fühling.)

The yield of seed is stated at from eight to sixteen centners per morgen. (Fühling.)

The varieties of beet seeds whose sounding names affect their sales do not in general come up to the extravagant commendations of them, and perhaps in nothing has more charlatanry been practiced than in this important article, to the good quality of which seedsmen often do not pay proper attention. The best sources of supply are always those beet sugar manufacturers who, impressed with the importance of the subject, conduct their seed growing intelligently, with a full understanding of their interests.

It remains to mention that change of beet seed may often be of great benefit, just as we find advantage in obtaining the seed for our grain crops from time to time from other districts.

A definite judgment as to what seed may be best for the locality is only to be formed from actual trial in the field. We must plant different kinds of seed on different plots, and select those which uniformly produce the best beets.

COST OF CULTIVATION. HARVESTING AND STORING.

The beet is a biennial plant, and does not bear seed until the second year, in which it completes its term of growth. When we take up the beets in the Autumn of the first year, for the purpose of manufacturing sugar, the plants cannot be said to be ripe. The root, however, at this time contains the largest quantity of sugar, which nature seems to have designed for the further development of the plant, and especially of the seed, for it entirely disappears from the beet during the formation of the seed. The interest of the sugar manufacturer, however, demands that his raw material shall be harvested when it is best adapted to his purpose, and the lifting of the beets is therefore best performed between the last of September and the middle of October, since the accumulation of sugar in the beet has at this time reached the highest point, and, if longer delayed, the harder frosts soon to occur (less than 4° R.=23° F.) would be likely to occasion damage. The most important period in beet growing, so far as the manufacturer is concerned, ends also in Autumn, or at that period at which the leaves cease to grow, and it may not be without interest to compute the outlay in money and labor incurred from the beginning to the end of the cultivation of the crop. Various writers state it differently, according to the difference of local circumstances.

Cost per Magdeburg morgen of growing beets.

	ACCORDING TO ACHARD.			KOEGEL AT GARDEN.			WEYHE IN WEGELEBEN.			SCHWARZ-WALLER.		IN RUSSIA.			SCHATTEN IN WEGELEBEN.			C. E. WALKHOFF IN MAGDEBURG.		
	No. of laborers.	Expenses.										No. of laborers.	Expense.							
		Thlr.	Sgr.	Thlr.	Sgr.	Pf.	Thlr.	Sgr.	Pf.	Thlr.	Sgr.		Thlr.	Sgr.	Thlr.	Sgr.	Pf.	Thlr.	Sgr.	Pf.
Rent				4																
Manure				5	3	6														
Team work or digging		3	10	3	22		3	20		4			4		4	15	2	4	2	
Superintendence					18			10			10					11	6			
Seed			15		24						20		2			24			20	
Sowing	6	1			10			22	6					14		20	10		10	
First hoeing	9	1	15					28				8				17	10	1	2	6
Singling the plants	8	1	5		11	2		17				20	2	18		13	4		14	
Second hoeing	7	1	5					15		6	15					18		1		
Third hoeing				2	12	8		13				8				13	4		24	6
Fourth hoeing								10								10	4		15	
Lifting	4		16	2	29	2	2	15				10	4		1	29	4	1	17	
Loading		2						25					4							
Carting				2	10					2					2					
Putting in the pits								17	6							*19	2	2	9	
Taking out of the pits					19	6										17	4			
Total	34	11	6	23	10		11	13		13	15	46	17	2	13	27	2	12	24	

*Less than the average, though a large portion was accomplished at this cost.

The average yield per morgen is from one hundred and twenty to one ndred and eighty centners of beets, the mean being one hundred and y centners, at a cost, exclusive of rent and manure, of 12 thlr. sgr.

In France, according to Basset (*Guide Pratique du Fabricant de Sucre*, ris, eighteen hundred and sixty-one), the estimated expense, exclusive rent and manure, as stated before that time by Mathieu de Dombasl, yen, and others, was taken to be 10 thlr. 18 sgr. per Magdeburg rgen, and rent, manure, etc., at 14 thlr. 10 sgr. In the same work, wever, the author further states that, at that time, the cost of cultiion amounted to 10 fr. 75 c. for one thousand kilogrammes of beets, ich would be (12 × 10.7 =) 34 thlr. per morgen total cost of cultivan. The crop there amounts to one hundred and eighty to two hund and eighty centners, averaging two hundred and thirty centners r morgen, from which, under favorable circumstances, six per cent, or thousand and eighty-four pounds of cane sugar is obtained, while, Germany, eight per cent, or nine hundred and sixty to one thousand r hundred and forty pounds of sugar are obtained, from the same a.

The total cost of sugar production per morgen in Germany is, with rage crops and growing your own beets, approximately:

nt, manure, etc.	about	16 thlr.	20 sgr.
ltivation	"	12 "	12 "
x on the manufacture, one hundred and fifty centners, at 7 sgr. 6 pfg.	"	37 "	20 "
pense of manufacturing	"	45 "	00 "
Total cost	about	112 thlr.	4 sgr.

In France:

nt, manure, etc., cultivation	about	34 thlr.	0 sgr.
x on one thousand two hundred kilogrammes er morgen (1,000 kilos. yield fifty-two of sugar, pon which the tax is 13 fr. 75 c.)	"	44 "	0 "
pense of manufacturing two hundred and thirty entners of beets, at 8 sgr. (in which the olasses, residuum, etc., have been already deducted)	"	61 "	10 "
Total cost	about	139 thlr.	10 sgr.

In Russia, the cost of production per morgen stands as follows:

nt, manure, etc	about	11 thlr.	0 sgr
ltivation	"	17 "	2 "
xes	"	12 "	0 "
nufacturing (at two hundred and fifty kopecks er tepkobetz*) one hundred and twenty centners	"	45 "	0 "
Total cost	about	85 thlr.	2 sgr.

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*The tepkobetz and berkobetz seem to be the same, *i. e.* four hundred Russian, or at three hundred and sixty English pounds.

There were therefore in—

Germany..................	(average)	1,200 pounds	cane sugar	per	morgen
France......................	"	1,380	"	"	"
Russia (at 7 per cent),	"	840	"	"	"

So that the cost per 100 pounds was approximately in—

Germany..	9 thlr.	11 sgr.	0 pfg.
France..	10 "	2 "	6 "
Russia..	10 "	4 "	0 "

This result has been obtained, however, only when the beets are grown by the manufacturer, and in buying the raw material, to say nothing of the difference in quality, the computation comes out quite differently for the manufacturer, and for Germany may be stated at, per morgen:

	Thlr.	Sgr.
150 centners beets purchased at 8 sgr. (to 10 sgr.)	40	0
Taxes (at 7 sgr. 6 pfg.)..	37	20
Cost of manufacturing..	45	20
	—	–
Total cost..	123	10

With a yield of eight per cent=1,200 pounds, the cost of 100 pounds of sugar is therefore 10 thlr. 3 sgr. 4 pfg.

In France:

	Thlr.	Sgr.
12,000 kilog. of beets (20 fr. per 100 kilog.)........................	64	0
Tax on the manufacture (as before)........................	45	0
Cost of manufacturing (at 8 sgr.)........................	61	10
	—	–
Total cost..	169	10

With a yield of six per cent=1,380 (say 1,400) pounds, the cost per 100 pounds is 12 thlr. 3 sgr.

In Russia:

	Thlr.	Sgr.
120 centners of beets (at 1 thlr. per berkobetz.)...................	30	0
Tax on the manufacture	12	0
Cost of manufacturing	45	0
	—	–
	87	0

With a yield of seven per cent=840 (say 850 pounds) (twenty-eight pounds per tepkobetz), 100 pounds of sugar cost 10 thlr. 7 sgr.

A comparison of these statements of cost with the market prices of sugar is sufficient to show that it is not the manufacture, but the growing, when a crop good in quantity and quality is obtained with moderate expenses, that yields the profit; or, in other words, that it is agriculture that derives the largest benefit. To the manufacturer who is frequently unable to sell his product for more than the cost of production, there is very little left for interest of capital, for improvements, for skilled management, etc., and the agricultural utilization of the refuse of the manufacture is frequently his entire profit.

It must also be taken into consideration that the resulting products of sugar that have been assumed, and which we may rely upon obtaining in the first months of the season, are often considerably diminished in the later months, because the beets, after long keeping, usually contain less

crystallizable sugar and more of those substances which produce an injurious effect by promoting fermentation. It is, therefore, one of the most important problems connected with the manufacture, to preserve the beets to the end of the season in an unaltered, sound condition, since it is not in the power of the most skillful manufacturer to produce a satisfactory quantity of pure crystallized sugar from a raw material, in which the sugar has already undergone a change, while, on the other hand, very tolerable results may be obtained, with less careful arrangement, from beets that contain sugar in its normal condition. For this reason the promoters of the industry have long been seeking for a method of keeping, that should be relied upon in all cases, and we cannot fail to appreciate the difficulty of the problem, when we consider that the beet is an aggregation of a multitude of little cells, the juice of which, like all vegetable juices containing sugar, begins to ferment so readily under the action of air and heat, and that this process of fermentation spreads with great rapidity from cell to cell through the entire tissue of the beet.

Too high or too low a temperature, a wilted condition produced by loss of water, and the unrestricted admission of light, are the usual causes which effect the destruction of beets when stored, and against which we have to contend; in the first place, by a suitable method of laying them up, and, during the whole Winter, by continual care and watchfulness.

When beets are put into too large heaps they begin to heat, and this seems to induce an alteration of the juice, a kind of viscous fermentation, by which the crystallizable sugar is converted into uncrystallizable grape sugar. At any rate, it has been generally observed that the juice of such beets is dark colored after defecation. Since, however, beets in their normal condition, contain only crystallizable sugar, solutions of which are not colored by lime or other alkaline bases, the dark results of clarification cannot occur by the action of lime upon crystallizable sugar, and, in general, this reddish color of the juice must be taken to indicate unsoundness in the beet, for beets taken in September and October from the field directly to the factory for working up, yield, after defecation, a clear, wine-colored juice. The crystallizable sugar must, therefore, in consequence of an unnatural increase of temperature in the heap, have undergone a change into a kind of sugar, which, under the same process of defecation by treatment with lime, produces juice of a reddish color. It seems to me that Dr. Hochstetter's experiments furnish the correct explanation, for he found that "solutions of sugar which contain only a trace of another kind of sugar, immediately become colored when heated with lime-water. We have, therefore, in lime-water, a reagent by which to detect the presence of another kind of sugar, in colorless solutions of crystallizable sugar." Our method of defecation, however, consists simply in heating the juice with milk of lime, and we, therefore, at every operation, effect on a large scale, this very reaction upon the uncrystallizable sugar, giving a color to the juice. On this theory, therefore, the coloring of the juice undergoing defecation, gives a perfect index as regards the keeping of the beets, and the beginning of any injurious change in their juice while stored, may be very easily detected.

It is a not uninteresting fact, which I have nowhere seen mentioned, that beets which, while growing, have been subjected to great drought and heat, yield, although worked up when fresh, just as dark a juice, after defecation, as beets grown under ordinary circumstances will only produce after being injured by heating while stored. That heating in the pits should produce still more injurious effects is easily accounted for.

The means employed to prevent injury from the heating of the beets, while stored for manufacturing into sugar, are of very various kinds.

The simplest seems to be to put the beets always in small piles or in thin layers. We all know that other vegetables do not keep so well in large heaps as in small ones. We do not pile apples and pears upon one another at all. Hay is apt to heat in large masses, while in small ones there is no danger. From all of which we may fairly conclude the liability to heat to be proportionate to the size (that is, the height) of the heaps. We ought not, therefore, to exceed the depth of three feet in the beet pits, unless provision has been made by open slats underneath, or in some such way, for counteracting the tendency to heat.

The increase of temperature in large heaps is especially due to an insufficient supply of cold air. I am convinced that we might pile beets up very high (even twenty feet) upon a small base, if we were only to permit free access of air from the sides; since, in storing in heaps, it is only requisite to give them surface enough to keep them cool. The larger the surface, or the provision for cooling and equalizing the temperature, the more surely will the beets be kept from heating; and it has been proposed that the heaps shall have one tenth to one fifteenth of a square foot of surface for every cubic foot of beets contained in them.

But if cold air is an effective agent for keeping down the temperature, earth would seem to be a still better one for the purpose. It is a fact generally known, that the temperature of the soil, even at a small depth, is very uniform; and that the extremes of temperature in the air are but slightly perceptible in the ground. In Germany the daily variations ceased to be observable at a depth of only six decimetres, or nineteen inches. It would seem, therefore, that earth presents one essential condition of uniform temperature, and, therefore, one valuable, available property for the preservation of organic substances. Experience, to a great degree, confirms this; and it is but natural to assume that beets, as well as other vegetables, will be best protected from sun and wind when entirely covered with earth.

In my experience with pitted beets, I have found it necessary and profitable to ascertain exactly the temperature within them by means of a thermometer inclosed in a box, placed at the side and which may be easily closed at the top, reaching down far enough into the heap to indicate the temperature of the air circulating among the beets. By making it a rule to observe and record the readings of the thermometer daily, we insure the uninterrupted watching of the pits, which would probably be neglected unless prescribed by the rules of the factory. As soon as the thermometer, which is, as it were, the vital principle of beet preservation, indicates an unnatural rise of the temperature, not to be explained by exterior causes, in any pit, the beets from that pit are to be consigned, without delay, to the factory for working up.

The following table exhibits the daily mean temperature of all the pits of five of the factories I inspected, with which the temperature of the air and earth is recorded for the purpose of comparison. From this it would seem that a temperature of 0° to + 5° R. is the most suitable during the Winter storage of the beets; and that it is, therefore, advisable to work up the beets immediately, as soon as the temperature exceeds this. We are, however, only to consider the increase of temperature due to the heat generated by the beets themselves, and not to confound this with the additional warmth naturally transmitted to the pit from the atmosphere.

Average temperature of the beet pits in the years eighteen hundred and sixty and eighteen hundred and sixty-one.

DATE.	SMELA.				JALLONOFKA.				KAPITANOFKA.				BALAKLEJA.				GURSCHOFKA.			
	IN THE PITS.		In the air, morning and evening........	In the earth, six inches below the surface........	IN THE PITS.		In the air, morning and evening........	In the earth, six inches below the surface........	IN THE PITS.		In the air, morning and evening........	In the ground, six inches below the surface........	IN THE PITS.		In the air, morning and evening........	In the ground, six inches below the surface........	IN THE PITS.		In the air, morning and evening........	In the ground, six inches below the surface........
	High.	Low.			High.	Low.			High.	Low.			High.	Low.			High.	Low.		
From September 1 to 5........	....	....	....	....	....	....	....	....	10.2	3	5	10	....	....	....	....	....	....	....	....
From September 5 to 10........	....	....	....	....	13	9.7	12	10.5	10	5	8.7	12.7	....	....	....	....	....	....	....	....
From September 10 to 15........	....	....	....	....	17.25	14.25	13.7	14.8	15	12	12	14	....	....	....	....	....	....	....	....
From September 15 to 20........	....	....	....	....	17.05	13.75	14.5	15.9	17.2	9.2	10.8	13.4	....	....	....	....	....	....	....	....
From September 20 to 25........	14	12	9.5	16.2	12.5	10.35	7.9	15	10.6	4.3	5.8	12	....	....	....	....	....	....	....	....
From September 25 to 30........	11.4	9.6	9.5	12	11.95	7.75	12.2	17	9.9	2.5	6	11	....	....	....	....	....	....	....	....
From October 1 to 5........	10.4	7.12	4.9	13	11.4	7.4	8.5	13.6	12	3.9	6	10	....	....	....	....	....	....	....	....
From October 5 to 10........	8.3	6.8	7.9	10	11.1	6	7.7	13	12.9	4	6.4	10	....	....	....	....	....	....	....	....
From October 10 to 15........	7.7	6.3	5.9	9	9.85	6.85	5	12.3	1.05	2.2	3	9	....	....	....	....	....	....	....	....
From October 15 to 20........	5.6	3	2.8	7.2	....	....	....	....	7	2.7	1	8	....	....	....	....	....	....	....	....
From October 20 to 25........	4.16	3.25	1.3	7.5	....	....	....	....	7	0.5	2	7	....	....	....	....	....	....	....	....
From October 25 to 30........	3.8	2.4	2.7	6.7	5.5	1.6	2.3	6	5.5	0.8	1.6	6	4.2	1.8	2	5.5	5	0.5	7.5	10
From November 1 to 5........	3	1.1	1.7	5.7	4.4	0.75	3.8	7	3.5	0.5	3.6	5.4	3.8	1.4	1.5	2.8	5.4	0.3	3.2	8.9
From November 5 to 10........	2.7	1.4	1.3	5.6	3.5	0.75	0.5	6.5	3.2	0.5	1	4.9	3.5	1.5	1.7	2.5	5	1	1	5.7
From November 10 to 15........	3.4	2.2	1.8	5.2	3.8	0.80	0.8	6	2	0.6	1.95	4	3.3	1.6	1.3	2.6	5	1	2	8
From November 15 to 20........	4.2	3.2	4.8	5.9	6	2.10	3.3	5	4.3	1.5	4.2	4	5.7	3	4.9	3.6	5.6	2.8	5	7
From November 20 to 25........	3.6	1.65	7.4	4.9	3.6	0.9	9.4	6.5	3.75	0.8	8.4	4	4.2	1.7	11	1.2	2.8	0.5	9.6	7
From November 25 to 30........	3.5	1.6	3.6	4.4	2.75	0.75	4.4	5.6	3.8	1	3	4	4.2	2.6	2.6	1.6	....	....	....	....
From December 1 to 5........	3.2	2	3.3	4.4	3	1.22	0.7	5	4	1.2	3.6	3.2	4.8	2.2	4.5	1.6	....	....	....	....
From December 5 to 10........	3.3	2.25	1.5	4.4	4	1.1	1.3	4.6	3.9	1	1.3	3	4.8	3.5	3.3	1.7	....	....	....	....
From December 10 to 15........	3	2.2	3.1	4.2	2.9	0.5	4.9	4.1	4	1	3.6	3	4	2.8	4.9	2	....	....	....	....
From December 15 to 20........	2.8	2.25	8	3.9	3.4	0.75	9	4.3	6.4	0.4	6.7	3	3.25	2.4	8.3	1.7	....	....	....	....
From December 20 to 25........	....	....	....	....	2.4	0.75	11.5	3.4	6.6	0.3	8.7	1.4	3.4	1.9	20	1.8	....	....	....	....
From December 25 to 30........	2.94	1.7	8.2	3.4	3	1.35	10.3	2.8	5.9	0.3	7.8	2	3.9	3.3	13	1.6	....	....	....	....

Too great a diminution of temperature is, however, quite as injurious as an increase; for beets cannot endure a greater degree of cold than —5° R. after being taken out of the ground. Experience, it is true, teaches that the beet will withstand a temperature even as low as —6° R.; yet it is better to work up such beets as soon as possible, although, with the exception of the crown, they are frequently not much damaged. If beets freeze, their cells are broken by the expansion of the juice as it becomes solid, just as a bottle, or even a cannon, filled with water, may be burst by the freezing of its contents. The sugar, however, is not the least injured by the freezing of the juice; on the contrary, it will be found that the juice of such beets has a higher specific gravity; a fact to be accounted for by the partial evaporation of water which takes place at the time of freezing.

If the Winter temperature were uniform, the preservation of beets would present no great difficulties; since it is only the change of temperature, the occurrence of thawing weather, that is dangerous. As an effect of these changes, the proteine substances of the juice are stimulated to an active fermentation; the result of which is a rapid oxidation (turning black) of the juice, followed by viscous fermentation and simultaneous destruction of the sugar. The fermenting agents in beet juices are, unfortunately, of so obstinate a character, if I may be allowed the expression, that they are rendered ineffective neither by cold nor even by boiling heat (whereas Appert's method is effectual for the preservation of other vegetables not so liable to fermentation); for, as is generally known, beet juice that has been frozen and boiled, especially when water has been added, is capable of fermenting even after defecation. On account of these difficulties, which ensue in the process of manufacture, from the fermenting agents in the juice being roused to destructive activity by the change from freezing to thawing, as well as on account of the troublesome mechanical obstructions caused by the frozen beets in the grinding machines and presses, it becomes an object of the utmost solicitude to prevent the beets from freezing.

A second requisite for successful preservation is, that the beets shall contain their natural quantity of water, and be in a fresh condition at the time of pitting; for experience proves that wilted beets are liable to mold in the pits, and decay more quickly.

Beets become wilted by the parching effect of the sun and wind, either while lying in the open air after digging, or even during growth in a soil having little capacity for retaining moisture during protracted heat and drought. In the latter case, they often, though worked up immediately after harvest, yield quite as red a juice after defecation, as, with beets of better quality, is only produced in consequence of long keeping and of heating in the pits. In the case of beets harvested in this wilted condition, the manufacturer may easily restore the natural quantity of water by sprinkling them copiously in the pits with an engine, since the beet absorbs water rapidly. This sprinking, which is frequently resorted to in France and Hungary in very dry seasons, has this further advantage, that, by the evaporation of a portion of the water, the temperature of the heap is quickly lowered, which cannot fail to do good. How quickly the beet, when in this condition, will absorb water, may be gathered from an experiment which I made in the Autumn of eighteen hundred and fifty-nine, by leaving beets entirely covered with water.

In twenty-four hours the beets absorbed 12.5 per cent of water, assumed a more solid, healthy appearance than when taken from the ground, and broke very crisp. During the second twenty-four hours they had taken up an additional three per cent of water, and began to crack, with increasing frequency toward the end of the time. After lying in water four days longer, the side walls were all broken; the beets were still white, but quickly turned black upon exposure to the air. The defecated juice was viscous, but very clear; while other beets, which had been exposed an equally long time to the air, yielded quite a dark juice. From this extreme case, I believe we may at least conclude that a beet, containing its natural quantity of water, will always produce a better quality of juice than a wilted beet.

In general, however, the wilting is the result of the treatment of the beets, promoted, in most cases, by their lying, after lifting, for too long a time in the open air; by which they not only become heated by the sun, and thus inclined to ferment afterward in the pits, but are liable to lose a good deal of water by the drying action of the wind. Hence, the generally approved golden rule of the Madgeburgers: "Out of the earth into the earth;" following which, they cover the beets immediately after lifting with earth or leaves, and pit them in moist earth without delay. Hence, also, the practice of old farmers not to go on with the beet harvest except with a clouded sky and a moist atmosphere, asserting that "the beets keep better," and to cover the beets carefully in the wagons when carried to the factory; above all, never to let them lie any length of time exposed to the air. Hence, also, the complaints after hot, dry Summers, when the beets, "as if they had been already long kept," are of inferior quality, and, when tested by the polarization process, indicate, by the leftward deflection, the presence of grape sugar. They are not in such cases "as they used to be;" that is, not containing the same quantity of water; not stored in the same natural condition; by exposure to the warmth of the air after lifting, they have lost not only water, but quality as well; and must, therefore, yield more easily to deteriorating agencies when in the pits than beets harvested in moist weather and covered at once.

The rapidity with which beets, especially on warm, windy days, part with water, has been established by the intelligent and acute observer, Count A. Bobrinsky, in Southern Russia, by careful weighing; and my experiments confirm his. The sugar manufacturers of hot countries had, therefore, to solve a decidedly more difficult problem in regard to the preservation of beets than the northerners, who are blest with abundance of rain, and, in general, more favored as regards climate.

The greater or less difficulty of keeping beets in different seasons seems to depend entirely upon the larger or smaller amount of hot weather and the greater or less quantity of rain while they are in the ground, and without these in suitable proportion the beet cannot grow well, still less, keep well. Their bad keeping has often been ascribed to entirely different causes.

The earth, also, in which beets, according to our rule, are deposited immediately after lifting, affords the means by which they, in consequence of their peculiar hydroscopic quality, may easily regain the necessary moisture, since the earth usually has so much to part with as to prevent the wilting of the beets. Upon this fact is based the opinion of farmers, that beets keep better in pits heavily covered with earth, than, for instance, in heaps covered with soil; and hence the practice with many of throwing damp earth between the beets when put into the pit.

Count A. Bobrinsky instituted the following interesting experiments:

Two beets, one of which had lost twenty-five per cent of its natural quantity of water, and was therefore wilted, and another beet in its natural condition, were each hung under a bellglass, which stood over a dish filled with water, at a temperature of 15° R., and, therefore, contained an atmosphere completely saturated with moisture. After a few days only, the wilted beet began to mold, while the other remained a full month without any sign of decay. He draws the conclusion, that beets must not lose more than ten per cent of their natural moisture if they are to remain in condition to keep, and that the decay of the beet occurs sooner in case of diminished than of a high degree of moisture.

It is, at any rate, an undeniable fact that in all countries in which hot Summers with little rain are the rule, what is called dry-rot in the beets occurs, and more especially where the careful farmer pits his beets too early, so that the Autumn sun has still power enough to warm the covering of the heaps entirely through, and so causes the heating of the beets in the interior (whence the steam on the heaps in the mornings.) In such cases, pitting beets later, when the days have become cooler, is decidedly better.

That the drying and wilting of beets is especially promoted by warm air and wind admits of no doubt; but in keeping beets, both of these act as preserving agents. The question then is, when and to what extent ought we to permit their action upon the beets? In approaching the solution of this question, I will state for the purpose of comparison a method of storing which is employed in other countries for grain, vegetables, etc.

In Hungary, in some parts of Russia, and elsewhere, grain is kept in pits excavated in firm ground (loam, clay, etc.), the openings at the top being of small diameter, so that they resemble huge bottles in the ground. The grain inclosed in these cavities, the openings being properly closed, is preserved uninjured, and the next Summer is in the best condition for use. Ought not beets to keep equally well stored in the same way? The result of experiments made so far answers this question in the negative; for the defecated juice of beets kept in this way is found to be of a reddish color and to contain but little crystallizable sugar. We may hence reasonably conclude that stagnant, fixed air is injurious, and that a circulation of air, though only moderate in amount, around and among the beets, is necessary in order to carry off the heat developed during the ripening of the beet, together with the gases that may perhaps be formed, and any excess of moisture.

Upon this theory of the advantage of a current of air, artificial ventilation was applied at first copiously throughout; but as a deficiency was injurious, so, also, an excess was found not to be of advantage, and the natural evaporation which a thin covering of earth admits, seems to be superior to every artificial method of ventilation, and to be most favorable to the preservation of the beet. When first stored, at which time the beets develop the most heat and the evaporation of moisture is the most rapid, a circulation of air must evidently be more necessary than during Winter. This is now generally effected either by leaving the ridges of the pits until the beginning of the cold weather lightly covered only for protection against the sun and wind, or, as in Magdeburg, by placing wicker baskets at two or three points on the top of the pit at the time of earthing up, and which, when withdrawn, leave open, or at least only lightly covered places. As soon as cold weather comes on, the protecting covering of earth is everywhere increased; but even at its full thickness it still admits of a circulation of air sufficient for the beets under the low Winter temperature.

If wooden tubes are used to give a current of air, it often happens that the beets lying close to them freeze, and, upon thawing, bring on decomposition, first in themselves, afterwards in the entire heap. The tubes are, therefore, discarded, and dependence is placed upon covering with earth, at first lightly, afterwards more heavily, as the best means for the removal of the confined air, and, at the same time, the surest protection against sun and frost. Too heavy a covering, however, must not be given immediately after lifting, since, in that case, the moisture from the interior, prevented by the thick covering from passing off, becomes condensed at the cooler points in the heap, and there, aided by heat, induces an unseasonable growth of the beets, and unnatural leaf formation, which is in the highest degree injurious.

An equally injurious growth is frequently caused by the action of light, especially in Spring. It is true that beets which have a second time put out leaves work up very well; but the growth always takes place at the expense of the sugar in the beet, although at first only reducing the quantity in the crown.

Nothing is more destructive to organic, easily fermented substances than contact with decaying organic matter, which, like yeast, affects all about it, and causes their complete destruction. In storing beets, therefore, everything is to be thrown out by which decay might be introduced; for instance, the leaves, which rot quickly, and injured beets, the juice of which soon decomposes by the action of the air, and then acts as a fermenting agent. Neither should straw be used for covering the pits, because it, partly in consequence of retaining rain water, soon begins to rot and is converted into manure. In fact, it is frequently found that the upper layers of beets immediately under the straw have become moldy.

The quality of the beets, however, the composition of their juice, essentially affects their keeping capacity. Thus small beets, containing a large percentage of sugar, keep much better than large ones containing little sugar, because the former, in general, contain much less of nitrogenous substances than the latter. These nitrogenous substances are always the chief promoters of decomposition; hence the complaints of the poor keeping quality of beets from heavily-manured fields. If there were any means of rendering the proteine substances in the beets harmless at once, all further anxiety as to their keeping would be removed. For this purpose the employment of sulphurous acid, in the gaseous form—sulphurating the beets—has been proposed; but so far as I know it has never been practically applied.

Instead of sulphurating the beets, Maumené proposed preserving the raw beet juice by means of lime. By the addition of lime, the proteine substances in the juice are decomposed without the aid of heat; for the presence of ammonia, the product of decomposition, can be immediately detected by means of a glass rod dipped in muriatic acid. The quantity of lime added varies from one to five per cent, according to the quantity of nitrogenous matter in the beets; the more lime, the less liable is the juice to change. It has been preserved in the best condition for a twelvemonth by the addition of a proper quantity of lime, and the manufacture of sugar might thus be carried on the whole year through with a raw material always of good quality, in fact constantly becoming purer, were it not that the expense of the reservoirs required for so large a quantity of juice, and the difficulty of separating the juice from the exceedingly bulky lime precipitate, renders the practical employment of this method financially impossible. The fact itself, that beet juice can be preserved for so long a time, in such a simple way, is in the highest degree instructive and valuable, although there is no possibility of its application on a large scale.

In considering the conditions essential to the successful storing of beets, we have so far constantly regarded the beet as a living plant, and its life as the agency best adapted to the preservation of a natural, sound condition of the root, and so of the sugar in it; and all our efforts have, therefore, been directed to the preservation of its vitality and the removal of all causes by which it might be endangered.

The plan of storing beets in a completely dried condition seeks to accomplish the same result, namely: the preservation of the sugar and the removal of causes of injurious chemical action, by means directly opposite, the destruction of all vegetable life. This method would accomplish the purpose equally well, because the nitrogenous substances in the beet, by the removal, in drying, of the water which it contains, become partially decomposed, and the tendency to fermentation is in all cases removed, if it could only be carried out in its theoretical completeness on a large scale, if in practice it did not involve the loss of a considerable quantity of sugar, and if it were not so expensive. Again, the beets intended for drying must, nevertheless, be kept until December, or else the drying establishments would require to be disproportionately large. It thus becomes necessary to store them for the first half of the season in pits, though perhaps with not so much care; so that the extra expense of carefully pitting all the beets would, after all, not be much greater. Besides, in slicing the beets, many of the cells will be cut through, and the juice exposed to injury by the action of the air, which continues during the drying process so long as any moisture remains in the beets, and is likely to destroy a considerable amount of sugar. Moreover, the expense of drying is not inconsiderable. Even at this large expense, an absolutely good and immutable raw material has not in any case been obtained; since the dried beet slices are usually hygroscopic, absorb water by degrees, and become more or less softened. The destruction of sugar then begins anew, although with much less activity, than in the freshly sliced beets. To escape this loss altogether, it is necessary to keep the dried beets in air-tight vessels (casks made tight by pasting paper or similar material over them), so that, even in this case, the storage involves difficulties.

Interesting experiments have been made in America, by order of Congress, to determine whether the sugar cane might not be dried successfully in countries beyond sea and shipped to Europe for more scientific manufacture. The final results of tests, with scientific exactness, was in the negative; it was found that the dried sugar cane was liable to damage in many ways, even by worms, and it was necessarily concluded that the scheme must be abandoned as entirely impracticable. If, therefore, not even sugar cane, the juice of which is usually an almost chemically pure solution of sugar, with very slight traces of salts and nitrogenous substances, is capable of preservation in a dried state without a considerable loss of sugar, how much more difficult must it be to apply the drying process to beets, the juice of which is so very liable to change. According to Frémy and Boutron, even lactic acid is formed in desiccated beets by gradual transformation. (Knapp.)

The advantage of the drying process, the possibility of working all the year round, is far from counterbalancing these evils for which we have as yet no remedy.

We come now to the preservation of green beets by the methods most generally practiced.

In the first place the nature of the beet, a biennial plant, in its wild state remaining over Winter in the ground and still continuing capable of growth, suggested experiments as to the possibility of its being kept without change in its original position, especially with the additional protection of a covering of earth. In the Winter of eighteen hundred and three and eighteen hundred and four, Achard covered beets with all their leaves uniformly with earth by means of a furrow four to five inches in depth drawn on each side. This covering proved not to be a sufficient protection against frost, for the beets in the Spring were found to be a mass of pulp.

By the method now generally employed, the beets are dug up and stored in quite large heaps or pits, which can be made at small expense. If the pits are made in the field, places on the borders or by the roads are to be preferred on account of greater convenience of removal, to placing them in the middle of the field, from which carting is much more difficult, especially in bad weather, requiring more exertion on the part of the team, besides badly cutting up the ground.

Placing the pits close by the factory not only permits the easy, safe conveyance to the factory at any time, so that the manufacture may be carried on with scarcely any risk of its regular routine being disturbed, but also admits of a daily examination of the condition of the beets, of the temperature of the pits, and in consequence the immediate working up of any parcels that may happen to begin to spoil. The carriage of a large quantity of beets during the brief period of harvesting requires, it is true, a good deal of team power at the time, and makes it necessary to cover the beets carefully in the wagons; but it is of great advantage in large establishments in districts where the roads are bad in Winter, since they thus have close at hand at least the larger part of the beets to be worked up.

The smaller factories indeed have, as is frequently the case in Magdeburg, all their beets, or at least most of them, pitted in the field and carted to the factory as required; and the same is the case with the associated factories in the rural districts, each associate pitting his beets in his own field, often at a distance from the factory, and out of regard to his own interest giving the most watchful attention to the condition of the pits, because he can deliver none but sound beets at the factory.

The pits are either formed entirely above ground, which is always necessary where water is likely to stand, or more commonly on the higher spots in trenches made for the purpose. The trenches for the reception of the beets are usually made two feet deep, so as to obtain earth enough for the subsequent covering, and not more than three to four feet wide, so as not to have too many beets in the pile, but to preserve that proportion between the surface and contents which insures the best effect of the covering of earth. The trenches may be made as long as the ground will admit, which will render the examination, removal, etc., much easier. In long pits, for greater security against damage from any cause, dividing walls of earth may be left at intervals, so as to separate the mass of beets into several parcels. The trenches are next filled to the depth of two feet, after which the beets are laid regularly along the sides with the crowns outward, placing them on one another, so as to keep the height even and form the smoothest possible surface. The successive layers are each drawn a little inward, so that their surfaces become oblique, the opposite sides constantly inclining towards each other until they come together, forming a surface so arched as to shed rain quickly and to be more easily covered with earth. The beets are only put in layers on the outside of the pile and only one beet deep; in the middle they are thrown in loosely without any regard to regularity. The two ends of the pit are laid up in the same way.

The pits are usually placed lengthwise, north and south, and their long sides, and therefore the largest proportion of the mass of beets, are by this simple expedient protected from the cold of the north wind and the warmth of the southern sun. The covering is put on evenly, six inches thick, though at first the ridges of the heaps are left almost uncovered; with increasing cold the covering is increased to one foot, and finally, before the occurrence of frost, it is made from two to three feet thick.

When the earth is not put on too soon, but just at the time the beets require it, this method of pitting will always be successful, since the temperature which always varies less in the earth than in the air, will be rendered uniform in the pits as well by the sheltered underground position of the beets as by the protecting covering of earth above. An additional recommendation of the method is its cheapness.

Others form the pits more above ground, which obliges them to pile more beets in layers for the outside rows and to dig the earth from the adjoining ground for covering them. Thus what they expect to save in excavation is lost through the additional labor in piling the beets, in covering them, etc. Upon the whole, this method appears to me to have fewer advantages than the other.

Since one cubic foot of space in the pit holds from thirty to forty pounds of beets, pits of the dimensions given will hold about (3×3×30=) two hundred and seventy to (3×3×40=) three hundred and sixty pounds per running foot.

On account of their small cost and large exterior surface, long pits are decidedly to be preferred to round ones, which are always more expensive to make, and besides do not give the best proportion between the surface and contents.

At Count Bobrinsky's factory, in Southern Russia, an entirely different method of storing is practiced. The beets are entirely under ground, in a trench formed with very sloping sides. A grating is formed eighteen inches above the bottom with common firewood, upon which the beets rest, coming within a few inches of the top of the ground. Through the middle, on top, is placed a triangular trough of boards, called the shield, the purpose of which is to give a larger surface for evaporation. The whole receives a covering of straw and fine earth, which may be increased or diminished, according to the changes of temperature indicated by an inserted thermometer. The space from the bottom of the pit up to the cross-sticks is left empty, and through it, by means of two tubes on the sides, reaching to the surface, a certain amount of ventilation is kept up through the beets, so that cold air may enter at night, while during the day any increase of temperature is prevented by covering these air holes.

Another method of storing much used in Russia is in cellars, which have two stories and are covered with earth. On each story—the floors being made of slats, or of boards pierced with numerous holes—the beets are piled about three feet deep. At the sides provision is made for currents of air upward and downward, and there are also openings in the roof for the escape of heated air.

The first cost of such cellars is rather large; the expense of storing, on the other hand, is very slight, since the beets are simply dumped in, and no further covering is required. Cellars admit of an easy inspection of their contents, both by the aid of the thermometer and by actual examination. The beets keep in them very well, and are easily put in or taken out even in the most stormy weather.

Instead of storing beets in the ground, it has been proposed to put them in layers with charcoal dust, in order to utilize its absorbent properties for the preservation of the beets. Experiments with potatoes have given very favorable results. The expense of the coal dust, however, prevents the application of this method on a large scale. Hard coal ashes have also been suggested for the same purpose, but have not yet been tried.

But whatever method of storing may be adopted, it is of great importance to take up the beets and pit them quite late in the season, if possible not before October. All experience teaches that beets taken up later, always keep better than those dug in September, and this fact is easy of explanation, for it has been established that during the very last of its growth there is a large increase of sugar in the beet, accompanied by a corresponding improvement in the quality and density of the juice. Moreover, in harvesting later, the prevalence of a lower temperature is of great advantage. It is not possible, in practice, to prescribe the exact time for beginning the beet harvest, for this will always depend upon the working force at command, but it must always be completed before the occurrence of severe frosts, that is to say, by the fifteenth or twentieth of October. It has been frequently said that the time for harvesting beets is when the leaves have turned yellow, but this seems to me to be no real criterion, for in dry seasons many leaves wither and become yellow as early as July, while, with the occurrence of cooler nights and copious dews, beets often put out new green leaves in September. There can be no perceptible indication of ripeness, because beets do not really become ripe the first year, and practically the only rule is, the later the better.

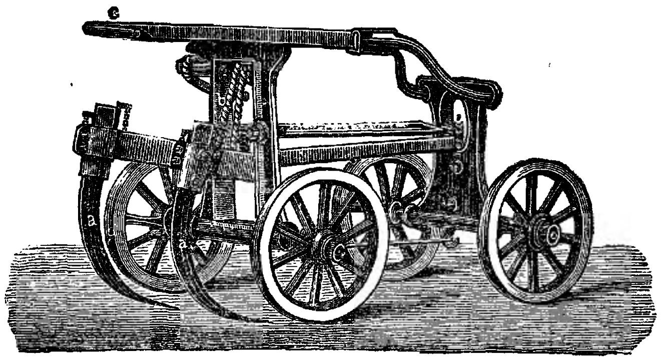
The beets are dug with long narrow spades, having a cross-piece at the upper corner, upon which a strong pressure of the foot may be applied for thrusting it into the ground. The two-tined forks which were formerly employed for lifting beets, should be entirely abandoned, because these tools, when thrust into the ground with the force necessary for loosening and prying out the beets, are very apt to penetrate the layer immediately surrounding the roots, and to wound them with their points. The narrow spade, however, always leaves some earth between it and the beet, thus protecting it from injury.

After lifting, the beets are picked up by the leaves, freed from adhering earth by knocking the roots together, and thrown into little piles, the leaves having been first cut off by a strong blow with a long knife. The piles are then immediately covered with leaves for protection from the sun and the drying effect of wind, so that the beets may not become wilted; the prejudicial effects of which have already been referred to.

It has frequently been recommended to put the beets in piles after lifting, with the leaves on, in such a way that they shall be on the outside so as to form a protection to the beets, and, at the same time, induce the continuation of the sugar-forming process, and, consequently, the improvement of the juice. It remains for the future to determine the correctness of this theory, and the possibility and advantage of reducing it to practice.

For the sake of economizing hand labor, the attempt has lately been made, with considerable advantage, to use machines for the purpose, instead of digging out the beets with spades or forks. The result is, greater certainty of securing the crop and less dependence upon laborers and weather. The accompanying drawing (fig. 17) represents a machine for this purpose—Siedersleben's Patent Beet Lifter. It consists of a four-wheeled carriage, from which, by loosening the rope, *b*, two long, knife-shaped tines, *a a*, run deep in the ground, directly under the rows of beets, and as the horses advance, lift the beets slightly out of the ground, without doing them any injury. The lever, *c*, serves for guiding the implement. It evidently requires fewer laborers merely to throw the beets into little piles and to leave them, with a covering of earth, until carted away, than by the present method and cleaning at the same time. At the time of carting, or collecting, they may be cleaned more easily, because the adhering earth, when dry, drops off more readily. In moist weather and wet ground, there is some difficulty in using the implement. But, nevertheless, it is a great step in advance to substitute machinery for hand labor for this purpose; and a few such implements to each factory would always insure the securing the beets, which, under some circumstances, may be exceedingly important. Mr. Siedersleben, of Bernburg, furnishes them very substantially and well made.

Fig. 17.



It is still an open question in beet growing whether the crown, the green, upper part of the beet, with the remains of decayed leaves adhering, shall be cut off at once after lifting, or not until afterward. If cut off in the field, the work has to be done hurriedly, and, on account of the quantity of earth adhering to the beets, irregularly; the crowns are, therefore, dirty, and with leaves attached, and, in consequence, are not so fit for feeding as if cleaned. The newly cut surfaces, moreover, expose considerable juice to the direct action of the air, and the keeping quality of the whole beet is thus considerably impaired. On the contrary, if the crowns be left on the beets, gathering is expedited, the keeping quality improved, and the crown furnishes a supply of nutriment for any after-growth that may occur in the pits, which, if the crown were cut off, would draw upon the valuable part of the beet. The cutting off is also much easier done after the beets have been washed at the factory, and the clean crowns make a very useful food for cattle.

In large establishments, where the crowns are not cut off at all, the yield of sugar is always smaller and of poorer quality, since the crown, as is generally admitted, not only contains less sugar than the other part of the beet, but a larger quantity of salts, which always impede the crystallization of the sugar. The juice of the crown is frequently found to contain no more than sixty-five parts of sugar in one hundred parts of the solid matter held in solution, while the juice of the same beets contained seventy-five. This difference in quality, however, varies very much, according to the manure employed, the method of cultivation, etc. The waste caused by cutting off the crowns at the factory varies according to the kind of beet, the way in which they have been grown, etc., and may be estimated at from six to fifteen per cent.

The beets which it is intended to work up in the first months of the season, up to the middle of November, are not put in pits, but merely stacked up in the factory yard, in pyramidal piles, three feet high and three feet wide, covered loosely with straw, and drawn from according to the daily requirements of the factory. In this way a saving of the labor of pitting the beets required for two months and a half, being at least one third, often even as much as one half, of the entire supply, may be effected.

STATISTICAL REPORT

OF THE

SACRAMENTO VALLEY BEET SUGAR CO.,

FOR THE

YEAR ENDING DECEMBER 31ST, 1873.

Capital invested, $350,000.
This company cultivated during the year, 1,050 acres;
Of which about 200 acres were lost through drought.
They sowed from 7 to 8 tons per acre.
From this they raised 8,500 tons of beets;
Making an average of 10 tons per acre.
To cultivate and harvest these beets, they employed about 400 men.
This supplied the factory for nearly 5 months.
They employed in the factory about 150 men.
The factory consumed about 75 tons per day.
Its capacity is about 90 tons per day.
The percentage of sugar in beets was 8;
Creating 1,360,000 pounds of saccharine matter;
Of which 958,000 pounds were first and second quality of sugar; 24,120 pounds of third quality sugar; 16,080 pounds of molasses.

During the coming year the company will cultivate over 1,500 acres; and, with the favorable indications of the season, they expect to realize therefrom 18,000 tons of beets, which will supply their factory for about nine months. The sugar, being of a superior quality, finds a ready market as fast as manufactured.

SILK CULTURE.

[From the Report of the Commissioner of Agriculture.]

SILK CULTIVATION.

BY LEWIS BOLLMAN, ESQ.

The efforts made in the past to establish silk culture in the United States have not been successful. The well-remembered *Morus multicaulis* excitement was the result of dishonest speculation, and having no sustaining influence of a legitimate character it failed to establish a single instance of successful silk production. But the condition of our country in its relation to this pursuit is widely different now, and it clearly indicates that the time has come when silk culture can be profitably followed, and, therefore, successfully established.

CAUSES THAT MAKE THIS CONDITION FAVORABLE.

The present condition of the foreign trade of the United States is not satisfactory. During the last five fiscal years the balance of trade against it was five hundred and ten milion eight hundred and eighty-six thousand eight hundred and seventy-three dollars, and in the last fiscal year, one hundred and eighty-two million five hundred and forty-seven thousand five hundred and sixty-eight dollars. This balance has caused during the same years an exportation of specie of three hundred and nine million six hundred and twenty-eight thousand six hundred and sixty-six dollars, leaving two hundred and one million two hundred and fifty-five thousand two hundred and seven dollars to be paid by the exportation of our national bonds. Two thirds of the carrying trade employed by our foreign commence is in foreign vessels, and the profits of this have been paid by us in these bonds. What the amount of it is, we have no data by which to determine, but it may be put down as not less than fifty million dollars annually. Add to these the large sums taken out of our country by Americans traveling abroad, and we can realize the causes that are so rapidly making our home national debt a foreign debt, and why we do not accumulate specie as a basis upon which our National Government and banks might safely return to specie payments.

It is difficult to see in what way these balances may be lessened. That the National Government will need large revenues to meet the interest on our public debt, and that duties, for many years to come, on foreign importations will remain high, is very certain. That some of them, especially our luxuries, will be increased, is more than probable. But to secure the industrial independence of our country, by producing commodities we now purchase from abroad, and for which our climates and soils are favorable, and by enlarging our manufacturing industries, so that much now imported may be produced at home, is the only way by which we may hope to have our foreign commerce permanently placed on a favorable basis, and some part, at least, of the products of our gold and silver mines retained at home.

Among the imports which have created this large balance of trade against us, is that of silk manufactures. In the last fiscal year it amounted to thirty-six million four hundred and forty-eight thousand six hundred and eighteen dollars. Duties, freights, profits, and other charges will make the purchasing cost of this importation to our citizens not less than sixty-six million dollars. This large importation, connected with the facts above stated, has acted most favorably upon the silk manufactures of the United States. According to the statement of a committee of silk maufacturers and operatives, to the Finance Committee of the United States Senate, the capital invested in them has increased from *three* to *twenty-five* millions of dollars, and the amount of raw silk imported in eighteen hundred and seventy-one was one million three hundred and thirty thousand pounds. Such a development of the silk manufacturing industry secures a ready and permanent home market to every pound of raw silk that may be grown in this country.

That the extent and progress of this manufacturing industry may be better seen, we take the following partial notice of it from the fourth annual report of Charles V. Riley, State Entomologist of Missouri:

> "Half a dozen years ago, within a radius of fifty miles of New York, there were not fifty looms running on broad silks and serges, where now there are nearer five hundred. In and around Boston there are nearly as many; and Philadelphia boasts of about thirty. Last Fall I visited Paterson, New Jersey, and spent some time in the surrounding country for the purpose of inquiring into this new industry."

At that place he found the largest establishments in the country manufacturing ribbons, dress goods, trimmings, braids, etc.

In Connecticut, five million dollars of capital are invested. But significant of the extent and excellence of their products is the large advertisement of the heaviest importer of the United States, Mr. A. T. Stewart, of New York. He advertises them as "American silks, manufactured by Cheney Brothers, Hartford and South Manchester, Connecticut, and sold wholesale by A. T. Stewart & Co., New York, Boston, and Philadelphia, and retailed at all first-class dry good stores." Heretofore American silks have been sold as imported goods, but now their superiority is so clearly established that such concealment is not necessary.

The total value of American silks manufactured in eighteen hundred and seventy-one was thirty million dollars, and of the imported raw silk about eight million dollars. In eighteen hundred and seventy-two the custom house valuation of the raw silk imported was five million six hundred and twenty-five thousand six hundred and twenty dollars; other charges would make it equal to that of eighteen hundred and seventy-one.

Such a development of the silk manufacturing industry secures a ready and permanent home market to every pound of raw silk grown here. Herein, then, is one of the favorable conditions to which we have referred, for heretofore our silk, like the wool of the Cashmere goat now, having no home demand, could not be sold, and hence not profitably grown. But there is another matter, in this connection, that requires a careful examination, namely,

THE PAST AND PRESENT PRICES OF RAW SILK.

Two fatal epizootic diseases have arrested silk production in foreign countries, especially in France and Italy. The government of England sought to revive the production of raw silk in its India possessions, and for this purpose required an examination of its past history in that country. We have a compilation of it by the Under-Secretary of India, Department of Agriculture, Revenue, and Commerce, and, among other topics of interest, he refers, incidentally, to the prices that formerly prevailed there. Raising the mulberry and gathering its leaves were often a separate pursuit in that country, and a prominent silk grower, Dr. Roxberry, refers to the prices paid for leaves. They were worth eight rupees (forty-six cents make a rupee) for *one third* of an English acre, paying a rent of two rupees, and leaving a profit of six rupees, or two dollars and seventy-six cents.

The wages paid the feeders of the worms and the reelers of the silk were, respectively, two dollars and thirty cents and two dollars and seventy-six cents per month. For leaves in the Madras district, the price fixed by the government was forty-six cents for three hundred handfuls, each handful to contain twenty leaves. For cocoons, five cents were given for three hundred. One thousand cocoons were required to the pound, and of this pound two ounces were good silk, eight ounces dried worms, and six ounces refuse silk and gum. According to this rate, it would require eight thousand cocoons to make a pound of reeled silk, and at the rates paid for cocoons one dollar and thirty-three cents would be paid for these eight thousand cocoons.

Reeled silk in eighteen hundred and fifty-eight ranged from one dollar and eighty-four cents per pound to three dollars and sixty-eight cents. In eighteen hundred and fifty-one the price for cocoons in France was thirty cents, a much better price than in India, but still unremunerative to our American labor. Against such prices it was vain to hope that silk culture could be established here.

Two causes have advanced the prices of raw silk: the general rise in prices of labor in all parts of Europe, and the fatal diseases among the silk worms in Italy and France, to which we have already referred. In India, reeled silk had advanced to three dollars and sixty-eight cents and five dollars and seventy-five cents per pound. The committee of American silk manufacturers and operatives, in their statement to the Finance Committee of the United States Senate, say that since eighteen hundred and sixty-one the prices of all raw silks in the countries of its production have been more than doubled. The average price of the raw silks imported into this country in eighteen hundred and seventy-one was about six dollars per pound. But Mr. Riley, in the report from which we have quoted, speaking of the "Dale Manufacturing Company," at Paterson, New Jersey, says:

> "Mr. Dale uses the best European machinery, and has a serimeter and dynamometer, for testing the strength and elasticity of the thread, and scales for weighing it, all from Berthand & Co., of Lyons, France. He employs three hundred and fifty hands, earning on an average from five dollars to six dollars a week. He uses nearly a bale (one hundred pounds) of raw silk each day, *for which he pays from nine dollars to twelve dollars per pound.*"

These prices, however, must be for the best reeled silks. When we notice, as we shall presently, the amount of food an acre of mulberries will produce, and the number of worms it will feed, it will be seen that these prices will give ample remuneration to the American laborer.

Having shown that the prosperous state of our silk manufactures must be continued by the protection they will find in the high duties that our national indebtedness will require, and that the present prices for raw silk give assurance that its production can now be successfully established, the next object of this article will be to show in what way this production can best be promoted.

THE EXPERIENCE OF OTHER NATIONS AGAINST LARGE INVESTMENTS.

The history of silk culture is as instructive as it is interesting. Large investments have been made by individual enterprise, and, to these, governments have added liberal encouragement. The different kinds of silkworms, and of the mulberry, have been brought together from every country. But however promising the beginnings have appeared, the ends have all resulted in failure, no matter whether the experiments were tried in moist or dry climates and soils; whether the mulberry was cultivated as standards or bushes; whether the worms were domestic or foreign varieties, or however complete the arrangements of the feeding-room. Our first duty, then, is to investigate the causes of these failures, and when we have done so the recommendations we will make can be better understood. Many leaders in new enterprises exhibit great zeal, but in their enthusiasm overlook the means of success. They are highly imaginative, seeing clearly enough the desired end, but not the obstacles that are interposed between the beginnings and this expected ending. The history of silk production abounds in such characters, and our own time is not free from them. The compilation of the Under-Secretary of India is instructive by indicating what these obstacles are, and we will now, as briefly as possible, point them out.

The production of raw silk includes two occupations, that may be separated or united, and these are the planting and cultivation of the mulberry, and the hatching and feeding of the silk worms.

1. *The mulberry.*—The mulberry in India, whether of the native or Chinese varieties, generally grew well in a moist or dry soil. Irrigation was necessary in some localities during the dry season, and this led to two modes of cultivating the plant, as standards or bushes. In the former, a greater space was given to the plants, but they were crowded in rows in the latter, that no water might be lost in irrigation. Leading cultivators differed much as to the respective advantages or disadvantages of these modes. The standards were grown into small treees, but kept back so as to make the gathering of the leaves an easy task. In the bush form the plants were cut back often, and every third year cut down to the ground.

Under both modes the plants grew well until the leaves were plucked or pruned for the worms, then they so far degenerated as to yield an insufficient supply of food, especially in the dry season or in dry soils, and the leaves were so immaturely developed as to be an unhealthy food for the worms, producing fatal diseases and inferior silk. No care in the cultivation of the mulberry could obviate these consequences. One of the cultivators says that "without much care, constant attention, and labor," the plants cannot be kept in proper condition. The cultivation recommended was to dig up the earth after the gathering of the leaves had been commenced; the soil to be manured in October, and in February fresh earth to be put around the plants. When grasses grew, the ground was to be dug up as often as was necessary to destroy them. This cultivation was much like that of the grapevine here. But while it could lessen it could not obviate sufficiently the evils we have mentioned to render the raising of the silkworm a profitable pursuit on an extensive scale. The general practice among the larger growers was to use the leaves *six* times during the feeding season, four by cutting branches, and two by stripping the leaves.

2. *The silkworm.*—In the numerous trials made in India with the different varieties of the silkworm, both by keeping them distinct and by crossing, the results have been unsatisfactory. The causes of this want of success have been stated very differently by different writers, and with much contradiction. Some attribute it to degeneracy in the mulberry; others to the worms being stinted in their food by the native feeder, especially during the season of drought, when leaves were scarce, some to the weakened constitution of the worm, caused by a too rapid reproduction; others to want of ventilation and cleanliness in the feeding room. The truth will, perhaps, be found more in all of these causes than in any one of them. The most successful of all growers was a native, Jaffir by name. He raised worms but *once a year*, stating that the leaves lose their best qualities if fed in the heat of Summer; that young leaves were necessary for young worms. He fed no more worms than would produce about sixty pounds of silk. Under European feeders of long experience and much intelligence, with feeding rooms so constructed as to avoid every objection, the failures have been more marked than among the native feeders, who raised but a limited number of worms as a household occupation, the feeding room usually being in the upper part of their huts.

One of the most prominent silk culturists was a Captain Hutton. He regarded the dark stripes on the worms, when young, as indicating the original stock, and their light color, when grown, as a mark of constitutional weakness, occasioned by too much forcing. For several years he selected for breeders those that longest retained these stripes, and said that this selection produced a more vigorous worm. But the final result may be seen in the following statement made by him:

> "I feel fully persuaded now, after several years of observation, that the constitution of the worm has been so thoroughly undermined that, although we may be able to restore it to its natural appearance, it will never be able thoroughly to shake off the various diseases to which it it has so long been subject. The only way open to the sericulturist, therefore, is to reseek, in the original habitat, in China, for the wild worms in their natural state of freedom on the trees; and, should any of them be procurable, then may the stock in Europe be gradually renewed, and the present impending ruin be averted."

The epizootic diseases, which have been so fatal in France and Italy, had not then reached India, for these views of Captain Hutton were written in eighteen hundred and sixty-four. These diseases are attributed to the constitutional weakness of the worm, occasioned by an injudicious and forced "hot-house culture." The largest cocoons, regardless of their firmness and other qualities indicating vigorous constitutions of the chrysalis, have been selected as breeders, until the vital powers of the worm have been so weakened that they cannot resist the approaches of disease.

It will be seen that the silkworm has become, in foreign countries, as constitutionally enfeebled as is the Irish potato. The rot is not more fatal than the *muscardine* and *pebrine*, the epizootics of France and Italy. But this enfeebled vital force is seen in the potato to yield to the least unfavorable condition of weather and soil, so that the quality of the potato is greatly impaired even when outwardly it is apparently healthy. So with the silkworm. It may feed well, but the inferiority of its silk betrays this constitutional weakness. Captain Hutton's remedy is the same suggested to reëstablish the vigor of the potato. But the seedlings from the Chilian importations rapidly yield to the influences that have made our older varieties so precarious. The causes, then, of failures in foreign countries are two. First, impairing the vigor of the mulberry plants and the nutritious qualities of their leaves, by too close and too frequent stripping and cutting during the feeding season; and second, weakening the vital forces of the silk worms by injudicious forcing.

[From the Rural Press.]

SILK CULTURE IN CALIFORNIA.

BY FELIX GILLET, OF NEVADA CITY.

EDITORS RURAL PRESS: Like every branch of agriculture, silk growing, although getting to be with us, too, in California, an old subject which some might think entirely exhausted, is no less a new one upon which a great deal will be said yet; for such is the case with every industry.

As far as we are concerned in this State, we have almost everything to learn in the art of raising silkworms and preparing silk for market; and it is not a little job to found in a new country a new industry like that one. Some have tried it and failed, and, discouraged, abandoned the enterprise; others tried, with more or less success, but for want of a market for either cocoons or eggs, feel rather despondent at seeing their efforts so little rewarded and at a loss how to make the business pay. Such is the real condition of sericulture in California at the present day. The *Rural Press*, I have noticed, has never been very sanguine about the possibility of establishing in our State this silk industry, and that for reasons which might at a first glance look very sound, such as the high price and scarcity of labor and the lack among our people of certain requisites for raising silkworms. Some correspondents of the *Rural Press* have kept in the same strain, so much so that people desirous of embarking into the business are slow at doing it, for fear of making a mistake.

Let us see how much truth there may be in such apprehensions, and whether silk culture can be made, or not, here, a regular paying industry; however, before going any further, permit me to state that I have given, and am giving, to this question of silk growing, all my thoughts, labor, and money; that I have studied it under all its bearings, pro and con, and that, though my opinion and views must be taken only for what they are worth, I will in the course of this essay bring forth facts and figures to show the correctness of what I advance.

The question may be divided into three, each one being absolutely necessary to the final establishing of silk culture in California; these are: First, the adaptedness of our soil to the culture of the mulberry tree; second, the rearing of silkworms; third, a market for our silk. These are three distinct questions which I will discuss at length in the columns of the *Rural Press* and in preference to any other paper, for I am satisfied that the said information will reach through your channel the very parties it is designed to.

The adaptedness of our soil to the

CULTURE OF THE MULBERRY TREE,

I regard it as a question well settled, but with this difference, that the rich and moist soil of valleys must be excluded, while that of our mountains must be regarded as the very best to produce a substantial and healthy food. For instance, silkworms might be successfully raised among the hills of the coast range, even in the small valleys located there, but producing lighter cocoons and superior in quality to those raised at a higher altitude among the hills of the Sierra Nevada; however, as the quality of the silk is only a secondary question, we may take it for granted that three fourths of our soil is well adapted to the culture of the mulberry tree. But of the different varieties so far cultivated in California, it is a no less irrefutable fact that some of them are almost worthless, while other ones are greatly superior for certain reasons, and more profitable to cultivate. To be more clear, I will name the varieties: The *multicaulis* I would reject as worthless; the small leaved *morus alba* as unprofitable; the *moretti* as producing an inferior silk. I have stated it in former letters to the *Rural Press*, the two varieties I have found on my own experience to be the best of all, as much for the size and quality of their leaves than for their larger yield by the acre, are the *morus japonica* and grafted rose-leaved. Having these two varieties for sale, I will not dwell upon their qualities and superiority, although I will refer to them when I will speak of the experiments I made last Summer.

The next question—this one of the soil settled—is

THE REARING OF SILKWORMS.

It is certainly a very easy work, which can be done by women and children as well as by men. There are, however, certain important points from which we cannot depart or else we may meet with disaster. First, the eggs must have been well preserved, for this is a condition indispensable to a successful rearing; secondly, the hatching must be done properly, so that the worms will hatch in three successive days; thirdly, molting times have to be watched with the utmost care. The best place where to preserve the eggs is certainly the mountains; the cold weather of the Winter being very beneficial to the eggs. This is the way I treat the worms at molting times, from the first to the last one. As soon as I notice that a part of the worms spread some silk round the litter, so as to procure for themselves a good standing when the time will have arrived to throw off the old skin, I cease altogether giving them food, never minding those that are not ready; then when the worms that went to sleep first have changed their skins, I wait to feed them till they have all undergone the same operation.

In this way the molting is done almost simultaneously, and the worms keep on very even in size. Otherwise, if a part of the worms only are ready to sleep, and food is given to those that are not, a great trouble is created; for the worms will look for another place where to get a good standing preparatory to their going to sleep, and in so doing, as that is repeated several times a day, they get weak, the molting lasts longer, and the final consequences are, that at the last molting the worms have hardly grown any larger, about half their size, and either die or spin a small, thin cocoon. I strongly suspect this to have been the main cause of failures in silkworm raising in California in years past.

To prove that, with proper care, silkworms can be raised in California on a large as well as a small scale, I will refer your readers to the success of F. Gillet and E. Muller, of Nevada County; Isaac Alter, of Lake County; R. Bonhomme, of Sonoma; Paul Cousonno, of Santa Clara; and other parties throughout the State. In Los Angeles, where failures have been experienced, Mr. Bonhomme raised successfully, last year, a hundred thousand worms. At Mayfield, in Santa Clara County, Mr. Paul Cousonno, an Italian gentleman from Milan, and well posted on all pertaining to the business, from the rearing of the worms to the reeling of the cocoons, raised the worms of over eight ounces of eggs—that is, between three to four hundred thousand, and obtained fourteen hundred pounds of cocoons, which he turned into eggs, and shipped them to Italy. Messrs. Gocex & Co., of Santa Barbara, I have been told, have been equally successful in raising a large quantity of worms, also shipping their eggs to Europe. So it is a well settled fact, that silkworms can be raised with success in this State—this second requisite for making silk culture possible and durable in California. Now, let us discuss the best way of getting a market for our silk. And this is a no less important question; for what would be the use to raise, successfully, silkworms, with no market for our cocoons, or a market with no remunerative returns, which would be no market at all.

In the first place, whether the market be more or less remunerative, we must have one; and as I have said it for the last three years, we will not have a market unless we introduce in the State reeling establishments called in Europe filatures. My intention having always been to start up one in Nevada, for my own benefit and that of the country at large, I wrote to several persons in France about it. Several propositions were made to me, and among them that of Mr. A. Laurent, a man of experience in the silk business, and the owner of three filatures in the south of France. He proposed to me to start one in California, with the coöperation of our most interested silk growers, and then he would fetch with him all the fixings of a filature of twenty basins, and a woman well versed in the art of reeling cocoons. Such a filature, that is, all the apparatus and machinery to run these twenty basins, not including the building, would cost, in France, between three to four hundred dollars; so that the whole reeling establishment would not be so expensive as some people may think. The next question to the establishing of a filature here is, how to make it work and pay; for it would take several years before it could obtain enough cocoons to have it run regular and steady, and how would it get along in the meantime? Mr. Laurent, to meet this objection, proposed to organize a company among silk growers, each one taking about fifty dollars worth of shares, and then applying to the Legislature for some aid. If all the main silk growers of the State were more close together, at a reasonable distance from the point where the said filature would be started, this coöperation proposition might do; but that is not the case, the distance between each other being too great. Anyhow, let every silk grower be well impressed with this fact, that the only way to obtain a market for our cocoons is to establish in every silk growing center a filature, where cocoons can be bought and there reeled into grege. Whether we do it through the coöperation system, or by our own private means, with or without any help from the Legislature, it is, anyhow, the only way of getting a market for our goods. I am satisfied that as soon as a filature would be established, and meet with success, that it would not take long to have more of them wherever they would be needed. The great trouble presently is this, as there are not in any county, or even several close counties put together, enough cocoons raised to keep a filature running, the person that would be willing to start up one would have to lose money by the operation till enough cocoons could be raised. And it is at this juncture that a State premium would be of immense help, and more likely to give an impetus to silk growing than all the premiums given already to mulberry plantations and the producing of cocoons.

As to the doubt of some people about a market for grege or raw silk, there need not be any fears about it. First, a bale of silk of a hundred pounds takes so little room, and its value is relatively so great, that it can even be shipped by express to the States and Europe with a good margin for profit. Second, the silk we raise in California, since we are successful in raising the finest races of silkworms, is of a very superior quality; and the demand is so great for such an article that a market is always sure to be had for it, and at fair prices. The next query, supposing we have a market for our cocoons, is, will it pay?

I can tell your readers how much they can expect for a pound of cocoons, of the French-annual races. In the first place, as wages are higher here than in Europe, the filature will have to buy cocoons at a price that will allow a reasonable profit for reeling them into grege; therefore, taking that into consideration, we wouldn't probably have more than seventy-five cents a pound, and it may be only sixty-five cents; that is, of fresh cocoons, while the chrysalis is yet alive; otherwise, when it has been killed and dried up, cocoons weigh three times more, and are worth accordingly. In Europe and elsewhere filatures buy cocoons right after they are spun, killing the chrysalis themselves. A pound of dried cocoons would, then, at the above rates, be worth between one dollar and seventy-five cents and two dollars and twenty-five cents. It is easy, with the above prices, for silk growers to find out how much they can get for their crop of cocoons, providing, of course, they would have a market for them. I can assure them that sixty-five to seventy-five cents for a pound of fresh cocoons is the biggest price they can get, so that they need not bother the *Rural* or any other paper about the way of getting a market for their goods, and the price they will get for them.

As I intend in this essay to go before any objection that can be made, or answer beforehand any questions that may be put to me, directly or through the press, I will tell your readers how many pounds of *fresh* cocoons can be raised with an ounce of eggs, and how many worms a single person can take care of. On the average, from twenty-five to forty thousand cocoons are obtained from an ounce of eggs. Twenty-five thousand cocoons will weigh about eighty-five pounds, which, at seventy-five cents a pound, would make from sixty to sixty-four dollars. I always mean French-annual cocoons, like the Biona races, and not Japanese, annual, or Bivoltines. A person can easily take care of about fifty to seventy-five thousand worms—more so, people that have families. To rear that number of worms, a room of twenty-four feet by sixteen, and eleven feet from floor to ceiling, would be required; if smaller, a smaller number of worms, then, would have to be raised. It is now to be seen that cocoons at seventy-five cents a pound would be remunerative enough.

So far, people that have planted mulberry orchards, did it in the expectation of making much money by it; for they were told that they could clear a thousand dollars an acre by turning their cocoons into eggs for the European market. This was a great mistake, for we cannot rely at all on this egg trade; and, although some silk growers here can make considerable money with silkworm eggs, we will have most of us to try to make the business pay in simply raising cocoons at so much a pound. We will make less, it is true, but we shall have every year a sale for our cocoons, which we might not have for our eggs. Any farmer or any person having a room for that use, and leaves for feeding the worms, can clear in forty days, easy, from fifty to two hundred dollars in silkworm raising; and I challenge any man to show me any other product of the farm and garden that will net, in so short a time, with so little labor, as much money. I say forty days, for an education of silkworms from hatching time to the spinning of cocoons, will take about that time. It is only the last two weeks that give much work, during the first three ages the worms being yet too small to require much food. Here are figures on the number of hands required to raise silkworms on a large scale: In France and Italy, in an education of two hundred and fifty grammes of eggs (nine ounces), that is of three hundred thousand to four hundred thousand worms in round numbers, one person is employed during the time of the incubation; two in the first age; four in the second; six in the third; eight in both the fourth and fifth. To make of California a silk-producing State, we must not, however, think that silkworms have to be raised on a large scale; on the contrary, for it is the small producer multiplied by the thousand, that makes anywhere of any industry a national one. I always did look to our farmers to build up our silk industry, by having each of them raise from twenty-five thousand to one hundred thousand worms. Here are on that subject some interesting statistics on the number of people engaged in raising silkworms in France, and the quantity of cocoons produced by them, that is, for the year eighteen hundred and seventy-two.

All together, one hundred and thirty-nine thousand nine hundred and twenty-two persons raised silkworms in that country; one hundred and three thousand six hundred and twenty-one on a small scale, and thirty-six thousand three hundred and one on a large scale. They hatched seven hundred and eleven thousand two hundred and nine ounces of eggs, that yielded nine million two hundred and seven thousand six hundred and eight kilogrammes (about twenty million pounds) of cocoons; (a small product, caused by the epidemic still raging there.) At the average, price of one dollar and twenty-seven cents a kilogramme, the whole crop would amount to twelve million dollars. With a full crop, it would double and triple that sum.

So we see that three out of four persons raising silkworms do it on a small scale, though the number of persons that do it on a large scale is certainly larger, I believe, than anybody has any idea of. In Italy four times as much silk is raised.

Another difficulty to those existing already in raising silkworms on a large scale, is the scarcity of hands and the high rates of labor. But it is a mistaken idea to believe that because hired hands are dear, we cannot make the business pay; and I have seen it suggested in the *Rural Press* that we would have to employ Chinamen to make it pay. Do not believe that, I mean as long as the latter will ask from one dollar to one dollar and a half per day; boys and girls can be had at a cheaper price, and I would by far prefer the latter at the same wages to Chinamen. I hired a boy at fifteen dollars a month without board, and I know he did as much work as any of those lazy Celestials would have done. If, of course, Chinese labor would come down to fifty cents a day, there might be more profit to employ them. Silkworm raising is such an easy, light work, that boys and girls may be employed with as much advantage as men, as far as the performing of the labor is concerned, but certainly at cheaper wages. I have never employed a Chinaman yet on my land, and I hope that I will not be compelled to employ any. Give first our boys and girls a chance, for in no other industry can they be worked with so much advantage as in that of silk growing.

Another incorrect idea is to believe that silk is raised in China at such low prices that it is impossible for us here to compete with them in raising silkworms. It is true that Chinese silk is cheap—half cheaper than the fine silks raised in Europe and California, but because it is an inferior article and badly reeled, that China and Japan silk is used for common cloth, the other for the finest cloth. Taken to Europe, our silk, from the beautiful races of silkworms which we successfully raise in California, like the Biona, Brianza, etc., will sell nearly double of what will bring those Asiatic silks. Therefore we must not care how cheap they will produce silk in China, as long as we are able to raise a superior article which has a ready sale, so great is the demand for the finest silk. It is the reason, too, why we cannot look to those San Francisco silk factories for a market, for they find their advantage to use the inferior but cheaper silk from Asia; while in Europe to weave those splendid goods that make the admiration of the world, they do not have enough of this number one silk like ours.

It is not so, either, that in China and Europe they can raise cocoons so much cheaper than here, taking into consideration the capital invested. The only advantage they have on us is the cheapness of labor, while the other costs are the same, and some, like the materials for building a cocoonery, in our favor. In fact, in China and Europe land is very high, a great deal higher than in California, so that we can raise leaves as cheaply here as they do there. In China, as well as in Europe, leaves sell from one half a cent to two cents a pound, according to localities and years; but nearer two cents than one half a cent. The main difference between those countries and California lies, then, in the higher wages we have to pay hands for cultivating our mulberry orchards and raising our worms; and I assert that this difference does not, after all, amount to as much as people may imagine at first glance.

To resume, I will say that silk culture may very well become in this State a settled, regular industry; but people embarking in the business must not expect to make by it as much money as over-enthusiastic pioneers led them to believe. I have shown by the foregoing essay that our soil is favorably adapted to the culture of the mulberry tree; that silkworms can be successfully raised, if properly taken care of; that we may get a market for our cocoons by establishing, in every county where cocoons are raised, filâtures for the manufacture of raw silk or grege; that the raising of cocoons can be made remunerative, considering the little labor and small capital it requires, at sixty-five to seventy-five cents per pound for cocoons; and further, to make the business pay still better, we must save labor as much as possible and plant none but large leaved varieties of the morus alba family. Finally, that the only way to make of California a silk-producing State, is to have farmers and everybody else so situated for doing it, plant a few mulberry trees and raise silkworms on a small scale. At any rate, it will take time to reach this end, and it is only by uniting our efforts that we shall be able to overcome obstacles and see our perseverance crowned with success.

I do not believe that I am over-estimating the possibility of making silk culture prosperous in this State, and as well settled an industry as any that we have already in our midst. Sooner or later, filatures will be established in California; till then, of course, silk growers cannot well expect to get rid of their cocoons; but, on the other hand, they needn't give it up, and had better wait patiently, take good care of their trees, plant new varieties, keep on raising silkworms, at least for practice, and with the establishing of filatures their expectations may be fully met.

I will now give a few details on experiments made by me last Summer. As I have said in former letters, the two varieties of mulberry trees that I keep and which I introduced myself in this State, are two large-leaved varieties—the morus japonica and grafted rose-leaved. Just to experiment, I fed one part of the worms with wild leaves, another part with half wild and half grafted (rose-leaved), and a third part with grafted leaves alone. The result was exactly the reverse of what it would have been in Europe; the finest, largest worms, and which were all of the same size, were those fed with the grafted leaves; next, those fed with half grafted and half wild leaves, while those fed only with wild leaves were very irregular in size and spun smaller and lighter cocoons. Otherwise they were all very healthy. I will certainly repeat the experiment, and on a larger scale, next year. My experiments would show, anyhow, that the grafted rose-leaved variety bears leaves which contain more nutriment than leaves from the wild varieties. In our dry soil and dry climate, it is probable that the wild leaves do not contain enough water to make of them a very substantial, although healthy food; while with the grafted rose-leaved, enough water is naturally contained in its thick leaves to constitute of it a food of excellence for the worms.

Before closing this letter, I will add that I have just learned by two Italian gentlemen at San Francisco, and on their way back to Italy from Japan, with a load of silkworm eggs, that Japan will not be able this year to supply Europe with half the quantity of eggs needed there next Spring. There would have been a good chance this Winter for some of our silk growers to find a good market for their eggs in Europe, where their supply will fall short of the demand.

NEVADA CITY, December 27th, 1873.

CHERRY CULTURE IN CALIFORNIA.

CHERRY CULTURE IN CALIFORNIA.

BY FRANKLIN RHODA, BROOKLYN, ALAMEDA COUNTY.

The cultivation of the soil has ever been considered as a sign of the advancement of society from the nomadic or barbarous state. Some even have ventured to assert that the degree of art evinced in this industry may be taken as a measure of the advancement of human society. Among all nations the different kinds of grain have ever been the first wild plants cultivated by man, and that for a very good reason, inasmuch as these form the staples of life. The cultivation of fruits, on the other hand, is only undertaken after the necessaries of life have become so abundant and the wealth has so accumulated that people can afford to indulge in luxuries. We say luxuries, for however plenty fruit may be, it is not a necessary of life, but a luxury indulged in only by those who can afford it. Still, the degree of perfection arrived at in the production of fruit is affected by many and various causes—the nature of the soil, the climate, in short, the natural adaptation of the locality to the growth of fruit, also probably to some extent by the nature of the people themselves.

It is much more seriously affected by the nature of the climate than the grains. The latter are seldom, if ever, affected by frost, whereas in the former, not alone the fruit, but the trees themselves, are often injured by it, and sometimes killed. It is to a great extent due to this cause that we find the grain growing in almost every part of the world, while the fruits are more restricted in area. It seems to be true that the finer fruits are more restricted than the poorer kinds. For instance, we find the apple and pear growing in almost every country of the north temperate zone, while the finer fruits, as the cherry and the different kinds of berries, are only found in particular localities, and of all these fruits none are more confined in area than the cherry.

Though this fruit is said to have been introduced into Rome by Lucullus, in the year sixty-nine, B. C., from Asia Minor; and, although we have records of its sale in London during the Middle Ages, its growth in considerable quantities for market is probably of very modern origin; and not until very recently has the production of new varieties from seed engaged the careful attention of orchardists in this country. Ohio seems to have taken the lead of all the States in this respect. One cherry culturist in that State, Professor Kirtland, originated twenty or thirty varieties, usually classed as worthy of general cultivation, and among which we find the names of many of our best kinds. This fruit is also cultivated, to a greater or less extent, in all the Western States. To this fact is due the early introduction of it into California; for those orchardists who crossed the Plains, always sought to bring over with them a few trees; and after planting them on this coast, they were not long in finding out that the climate and the soil on the Pacific Slope both concurred to reward the labors of the fruit grower.

With regard to the early history of the cherry in this State, it is difficult to determine either when the first trees were planted, or when the first fruit was sold; but, as early as eighteen hundred and fifty-two, cherries were sold in San Francisco by some of the commission merchants, who are still engaged in the same business. As to the quantity sold, all we know is, that it was very small; in fact, even later, when the sales of this fruit came to be very large, it was very difficult to get statistics on the subject. In the files of the *Evening Bulletin*, we find the number of pounds of strawberries received in San Francisco for each day of every season, as far back as eighteen hundred and sixty; but, in all these, we find no statistics as to the cherry crop, except one. In the *Bulletin* for July tenth, eighteen hundred and sixty, we find an estimate of the value of the crops of different fruits for eighteen hundred and fifty-nine, by J. B. Hill, a prominent commission merchant of San Francisco. As the estimate may be interesting for information which it gives of other fruits than cherries, we give it in full:

Peaches	$150,000	much injured by the frost.
Apples	75,000	only slightly injured.
Pears	60,000	
Grapes	75,000	
Strawberries and raspberries	75,000	
Apricots, plums, cherries, etc	15,000	
Total fruit crop of 1859	$450,000	

Here, then, we have the value of the fruit crop, including all the different kinds, making a very large total; but how small the cherry crop must have been when the apricots, plums, cherries, etc., only amounted to fifteen thousand dollars. If we suppose that two thirds of this last amount was the value of the cherries alone, we can easily find approximately the crop in pounds. In examining the *Bulletins* for eighteen hundred and sixty, we find, occasionally, the price of cherries given as follows:

May 25th	75	cents	@	$1 00 per ℔.
June 4th	50	cents	@	75 per ℔.
June 7th	37½	cents	@	75 per ℔.
June 13th	15	cents	@	65 per ℔.
June 19th	50	cents	@	75 per ℔.
June 22d	35	cents	@	60 per ℔.
June 28th	40	cents	@	1 00 per ℔.

Average, 43 to 78 cents per pound.

From this, it is quite certain that fifty cents per pound is below the average for the whole crop; we then have $\frac{2}{3} \times 15{,}000 = \$10{,}000$, which cannot possibly represent more than twenty thousand pounds, or much less than the greatest sales made in San Francisco in a single day, at the present time. From Mr. Hill's estimate, we also see that at that time the values of the cherries sold was less than that of any of the other great fruits, as the peach, apple, pear, etc.

Since that year, however, the relative value of the cherry crops have steadily increased, although, in common with all the rest, the prices have fallen very much below what they were then. The average price, last year, was almost exactly fifteen cents per pound—a very great reduction on the prices of eighteen hundred and sixty. As to the quantity now produced in the State, as we have said before, it is very difficult to get information. The commission merchants usually keep the account of each producer without specifying the different kinds of fruits sold, but, from some, we have been able to get very crude estimates, from which we should infer that the amount sold in San Francisco during the cherry season, that is, May and June, must be more than one million pounds—how much more we cannot say. In one day, this year, forty thousand pounds were sold in San Francisco. For a great many years Alameda County almost monopolized the production of strawberries; in eighteen hundred and sixty it, alone, produced for market, two hundred and fifty tons. This industry has long since died out here, (1) and been transferred to Santa Clara County, but, to a certain extent, the culture of the cherry has taken its place. For a time, probably, more than three fourths of all the cherries in the State were grown in the vicinity of the little Town of San Lorenzo, in this county; and the greater part of these in the orchards of Messrs. Meek and Lewelling. Of late years, however, the cultivation of this fruit has been tried, with marked success, in other parts of the State, especially in Napa and Solano Counties, and from thence great quantities of very fine fruit have been brought during the last two years. Besides these places, much of this fruit is grown near Marysville; but, on an average, it cannot compare in quality with that produced in the counties just mentioned. Some fine fruit is also sent from Sonoma County, and, in small quantities, from many different points in the State. All these rivals are fast reducing the relative importance of San Lorenzo in the production of the cherry.

So much for the history of cherry culture in this State. We will now consider the practical growth, cultivation, etc., of the fruit. We shall take up the various subjects under this head in the order of time, and shall follow the subject from the first selection of the location to the time when the fruit has been sold. In order that we may consider the subject systematically we shall divide it into three subordinate heads, namely:

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(1) Although it does not strictly belong to the subject under consideration, it may not be improper to inquire the cause of the disappearance of the strawberry interest from Alameda County. There seems to be reason to believe that it is due to some change in the climate. From ten to fifteen years ago the strawberry plant used to thrive here, and all along the road between Oakland and San Leandro there used to be many strawberry fields, some of them containing as much as forty or fifty acres of land; now the strawberries will not grow well, not even in gardens, unless they be well watered. There was a field of some twenty acres planted near Fruitvale some five or six years ago, but it was soon destroyed by worms. I think that our climate here is much dryer than it used to be. I remember that along in eighteen hundred and sixty, eighteen hundred and sixty-one, eighteen hundred and sixty-two, and eighteen hundred and sixty-three we used to have very dense fogs during the Spring and early part of Summer, which used to stay till nine or ten o'clock in the morning. Then vegetables of all kinds grew much better than now. Beets, cabbage, turnips, etc., all grew better then than now, at least, on the upper land, these seemed to do very well, yet, in Alameda Township, whether as well as formerly, I don't know. This is probably the cause of our losing the strawberry monopoly.

First—The selection of the ground and the trees.
Second—The planting and subsequent cultivation.
Third—The fruit, its preparation for market, etc.

I—SELECTION OF THE GROUND.

We shall now proceed to the consideration of the first of these. A person desirous of planting a cherry orchard, of course, must first select a suitable piece of ground, and although this may appear a secondary matter, it will really affect his success as a fruit grower. It seldom happens that such a person is perfectly free to select his land in any part of the State; if such is the case, however, it will be a great advantage to him. But in order to make a selection in such a case, he should be thoroughly posted in all matters relating to cherry culture. The selection of the location, where there is only a limited number to choose from, is a more simple matter, and this is all that will here be considered. A few rules will serve as a guide in this selection; other things the same, a rich loamy soil will be best; if some sand be present, it will be none the worse for it. The most important point to be considered is the drainage, as, if the ground is so situated that at any time in the year water will stand about the roots of the trees, the fruit will be poor, and the trees injured, and possibly killed. It has been found that even where the drainage on the level land is pretty good, and the soil richer than that on the hillsides, the latter will often produce better fruit, and in greater quantity, than the former. Another thing that must be carefully examined is the lay of the land with regard to the direction of prevailing winds, it being important to avoid exposed situations. And in this particular there will be a wide range of choice, even in a very limited area; certain places being much more exposed than others. Here it may be proper to state, that the hills are not necessarily more open to the winds than the hollows, as we often find that along the latter, from some cause due to the topography of the country, there is a strong draft, as it were, which may not extend to the tops of the inclosing ridges. If the climate of the place be not the best adapted to the growth of the cherry, and too cold to ripen the fruit well, it will be advantageous to select a piece of ground on a slope facing to the south, as that will be the warmest and most open to the rays of the sun. If the climate be too warm, a piece of land facing to the north will be the best.

II—THE PLANTING AND CULTIVATION.

After having selected the land for the orchard, it should be well plowed and harrowed till it is quite smooth; if convenient, it will be well to spread over the ground a considerable thickness of good manure before plowing. By this means the manure will be mixed with the soil, and will be much more beneficial than if it be spread over the surface after planting. Next, the ground is carefully staked off in rows, a peg being driven wherever a tree is to stand. These are placed at distances from each other varying from fifteen to twenty-five feet; these two distances, however, are extreme cases, and are seldom met with in good orchards. Probably the best distances will be somewhere between sixteen and twenty feet. It is a common custom to plant the trees either sixteen feet in the row, with the rows eighteen feet apart, or eighteen feet in the row, and the rows twenty feet apart. If the trees are closer than the smallest of these distances, they will crowd each other, and if farther apart than the largest of these distances, they will take up an unnecessary amount of land, and, as is found in practice, will not bear so well as when closer together. This last is probably due to the fact that the trees in this case lack the mutual protection from winds which is given by the former, and are less well adapted to retain the heat which is received from the sun. The holes should be dug about three feet in diameter, and one foot deep. Sometimes the loose soil is shoveled from the surface of the ground into the hole, and the tree planted upon it, and this will be found to be of great advantage. If this plan be adopted, the hole may be made deeper, to suit the amount of surface soil intended to be put in.

The next thing to be done is to select the trees to be planted. The orchardist should be careful to take none except healthy and thrifty trees of the proper varieties. Trees which from any cause have become stunted in the nursery, may be much improved by transplanting in good soil, and, under proper cultivation, the effect of this dwarf habit thus early contracted may in time disappear. But still the difference between the thrifty tree and one which has been stunted when young will be noticeable for a long time, and the difference between the quality, as well as the quantity, of fruit produced, will be no less manifest. The difference in the first cost of the trees, if anything at all, will be inconsiderable compared with the gain in the fruit resulting from the planting of good trees. Diseased trees should be studiously avoided, since they seldom ever recover; and, except in those rare cases where they do, they will neither bear good fruit nor even a large crop of poor fruit. And just here is one of the great differences between stunted and sickly trees—the one bears very full, the only objections being that the tree does not grow large and that the fruit is generally small; but the diseased tree bears only a few cherries of indifferent size and usually very unnatural taste; it may be known by the appearance of the leaves and by the fact that it is nearly always accompanied by exudation of gum. Many different methods have been proposed for curing such trees, but the cure is uncertain, and at best can never make the tree as good as the healthy one.

Even more important is the second consideration, namely: the selection of proper varieties. Since among cherries there are such great differences, in many particulars, as to price, size, and quantity of fruit produced, it is impossible to give any special recommendations as to what are the best varieties, inasmuch as this matter is so much affected by the location. The remarks made in the Eastern States are as inapplicable here as those in the European books were in those Eastern States. The climate of California differs from that of all the other States in having a rainless Summer, and, whether this be considered as an advantage or a disadvantage, it at least has the effect of necessitating a complete change in all the principles and appliances of horticulture. It is especially worthy of note, that fruit trees here do not grow to the size attained by the Eastern trees, probably resulting from the fact that here they bear younger. For instance, in Italy, the home of the orange, that tree usually bears its fruit fourteen or fifteen years after coming up from the seed, while in the southern part of this State, where this fruit is grown in great abundance, this period is reduced to nine or ten years. Another example is that of the pear, which, in the States to the east of this, does not usually bear before the fifteenth or twentieth year, while here it bears at an age of from four to six years.

In both these cases we find that the size attained by the tree is directly proportioned to the age at which it bears its first fruit. But not alone are the growth and time of bearing affected by a change of climate, but it has often been noticed by fruit growers that varieties are so altered by being transplanted in a different region, that they can no more be recognized. This fact was long ago noticed by the fruit growers of the East, who found it very difficult, in many cases, to prove the identity of European and American varieties, where the latter merely resulted from the former by long continued cultivation in a different soil and climate. The same principle doubtless holds with regard to California, but to determine this, one must have a thorough knowledge of the horticulture of both regions. A variety which is productive in one region may be unproductive in another, even though the general appearance of the fruit remain unchanged. As a single example of this, we would mention the case of the Black Eagle variety, which is spoken of in the American fruit books as being a fine fruit, but unproductive at the West, while in this State it is the most productive of all varieties, and bears well when nearly all others fail. Another fact, closely allied to the foregoing, is the great difference between the productiveness of trees in orchards which are situated quite near each other. Almost every year some varieties will fail to produce a crop; exactly what is the cause of this, is very hard to tell. It is not, probably, due to a full crop the previous year, as these failures come without any regularity, and in some very few varieties scarcely ever come at all. The nature of the season will generally determine whether the total crop of all the kinds will be large or small, but it is almost or quite impossible to trace these special failures back to the weather. In some cases this can be done, however. It is well known that there is quite as much difference between the several varieties, as to the time of blooming, as there is in the time of ripening. Now, if there happens to be a very heavy frost when the blossom has fallen from a certain variety, and the little cherries are exposed to its action, these will probably be destroyed by it, and there will be a failure. But even in the best seasons, when there have been no frosts in the Spring, and everything has been most favorable for a good crop, there are always some varieties which fail to bear. Furthermore, we have known varieties to fail in one orchard, while in another, less than a mile distant, in the same year, the same varieties would bear a full crop, and vice versa. Some systematic, accurate observations on this subject would probably resolve the mystery. In some cases there seems to be a permanent difference in the productiveness of certain varieties in places not far separated from each other; for instance, in San Lorenzo the Graffion variety seems to be very productive, while in other places in this county it bears a good crop only once in many years.

From these examples it is easy to see that it is very hard to give any special recommendations as to the best varieties to plant. Nevertheless, the list of good cherries contains only a limited number of different kinds, some of which can be recommended for all localities. On account of the occasional failures which we have already spoken of, it will be well to have a number of varieties in the orchard, so that if some fail there may be others which will bear well. Of course, in the eye of the disinterested cherry culturist, one variety is better than another only as it yields him a greater revenue for the same outlay, and we shall take this as the basis of any such classifications we may make. A few general principles may be laid down for the selection of varieties. If the location be such that the Spring is warm, the cherries will ripen early, and, for such a place, it will be well to have the earliest varieties so that you may get the full advantage of the climate. It is evident that if the cherries naturally ripen late at the place selected, it will not be best to have early varieties, since they would, at best, only ripen in the midst of the cherry season for these earlier locations; in this latter case, it would be better to plant very late varieties, as these would come into market when there would be few or none received from other places. The reasons for making these selections will appear evident to any one who has taken the trouble to note the price of fruit during the season. The price of the first few boxes received is generally from one to two dollars per pound; after this, it gradually decreases to a minimum at the height of the cherry season, and then increases till all the cherries are gone, but never again reaching the prices which were received in the early part of the season. This is due to the fact that about the time of this last maximum, which is about the fourth of July, there is such an abundance of other fruit, as peaches, plums, pears, apples, etc., that there is less demand for cherries than in the early part of the season, when strawberries were almost the only fruit in the market. From this we see that, other things being equal, early fruit is more profitable than late. If the climate be such as not to produce either extreme, the prolificness of the variety and the salableness of the fruit need alone be considered. The quality of the fruit alone will not serve as a good guide in this selection, as some of the finest varieties of cherries never bear a full crop of fruit, and also the varieties that one might select as best in taste, will not necessarily bring the highest price. Another thing to be borne in mind is, that, other things the same, black cherries will bring the highest price. The fruit grower finds many of the so-called flesh-colored cherries which, to him, taste better than most of the black ones. Why there should be this difference between the taste of the consumer and that of the producer no one can tell; nor yet does any one know that there is such a difference. It is probably all in the eye of the customer, a kind of fancy for that particular color. Nevertheless, to the fruit grower it matters little whether this be a fancy or not; it is to his pecuniary advantage to satisfy the desires of the fruit eaters in this respect. It is not best, however, to confine one's orchard to black cherries alone; rather grow some black and some white.

In selecting trees from a nursery for planting, yearlings should be preferred; two-year-olds may be used, but none older than that should be taken. Either grafted or budded trees may be used, there not being much choice between them; some prefer the one, some the other. As with all other orchard trees, the cherry trees should be carefully dug out of the nursery, leaving all the roots to the tree that is possible, and cutting off all that may have been injured in digging. The planting of the cherry tree is nothing peculiar; they are usually planted as nearly in straight rows as is possible, either by the line or by sighting. They should never be planted in the rain while the ground is muddy. The best time for planting is late in the Winter or early in the Spring; some time before the sap begins to rise. In order to make cherry culture profitable, the trees must be well cultivated, and it is well to plow twice around each row just after the first rains of Winter have softened the earth enough to allow of it. The soil in this first plowing should be thrown toward the trees, thus forming a piece of high ground near them, with a furrow on each side the row to lead off the water. This is to prevent the water from standing about the trees in Winter, which, if permitted, would hurt them. After this, it is not customary to work the ground till next Spring, after the weeds have come up and the very heavy rains are over; then the trees may receive a shallow plowing, the dirt being thrown from the trees, and the patches along the rows, which were left by the plow, cleaned of weeds by means of the hoe. After this, the ground will be worked by the use of the cultivator, which instrument should pass over it once every two weeks till the trees are in bloom, or later, if the trees are far enough apart to allow the horse and cultivator to pass through without very great injury to the limbs or blossoms. This loosening of the soil draws moisture from below to the surface. It is said that in some of the warmer parts of the State the cherry trees are irrigated, but irrigation in this county would be more of an injury than a benefit. We have seen it tried, and the experiment nearly resulted in the death of some fine trees. The difference of effect in the two cases is undoubtedly due to the different dryness of the atmosphere in the two places. No small plants, as berries, etc., should be allowed between the trees. Whenever a tree is seen to bear small fruit, and to make very little growth, it should be topped down by cutting off the extremities of the limbs; in many cases, also, it will be well to thin out some of the limbs. The next year it will put out a strong growth of shoots and will bear large cherries.

III—THE FRUIT AND ITS PREPARATION FOR MARKET.

As the last act in the fruit grower's drama, as the reward of all his toil, the curtain is raised and reveals to his view a scene which, composed as it is of luscious fruit of many different colors, and shades, and sizes, causes him to smile at the prospect of once filling his pocket with the proceeds of Nature's generosity. But, alas for human happiness, imagination too often builds her castles on insecure foundations, and "distance lends enchantment to the view." Not even the cherry man can be sure of a good reward till he has got it. What the prices may be, whether high or low, no one can tell beforehand, yet on them depends the revenue derived from the cultivation of the fruit. Whatever may happen to be the state of the market, whatever may have been the process by which the cherries have been brought to maturity, it cannot be denied that, gastronomically speaking, we have arrived at the most agreeable part of our subject. That, however, is all a matter of taste. The progress of fruit culture in California is as unexampled as that of her grain production. It is almost or quite impossible to procure statistics of the fruit crop of this State; and in no fruit are the data so meager as in the case of cherries. Still, from a few disconnected estimates, we may be able to realize the rapid growth of this new industry. In eighteen hundred and fifty-nine, twenty thousand pounds of cherries were sold in San Francisco, at an average price of fifty cents per pound. It is estimated that in the present year the crop will amount to one million pounds, selling at an average price of fifteen cents per pound. As the quantity has increased the price has diminished, but not in the same ratio. In the last twelve or thirteen years the price has fallen to one third, but the quantity has increased fiftyfold. From this it might be inferred that the price would finally be reduced to nothing, but this year a new industry has come into the field to relieve the overburdened market. The fruit-preserving companies, which have of late years put up such immense quantities of other fruit, this year have done the same with cherries. They make a standing offer of eight (8) cents per pound for all that cannot be sold in the market for more. This, then, is the minimum price below which even cherries cannot fall.

The picking of cherries, though seemingly such a simple affair, must, in reality, be learned, like any other department of the business. A man who has never picked cherries before, must first be taught to pick the cherries with the stems, the natural idea being in almost every case that as long as the cherries are picked it don't matter how it is done. The next thing he must learn is to distinguish the ripe from the green, and pick accordingly. He may learn that a Bigarreau or Governor Wood must be red when ripe; if you do not watch him closely he will pick some black variety by the same rule. Each variety must be picked by itself, and not mixed with any other; but as all the trees of one variety may not be together, but may be scattered around in different places in the orchard, the picker must learn to distinguish the different varieties and know which is which. After learning all these things, practice may soon make him a good cherry picker.

So much for the picking; next as to the preparation for market. The fruit is usually put either in boxes, which may be of various sizes, and sent without any further preparation, or else they may be put in small drawers, and these into chests, and shipped in that condition to market. The first kind of boxes most generally hold from twenty to thirty pounds of cherries; the latter hold one hundred pounds to the chest. The material is often bought at the planing mills and made into boxes by the fruit grower himself, all the pieces having been sawed off to the proper length at the mills. In other cases, the boxes are bought already made up. The material for a box which will hold from twenty to twenty-five pounds costs nine cents. Several years ago boxes which were made stronger than these were much used, costing fifteen cents apiece, and the plan was, when a box of fruit was sold to any one by the commission merchant, the buyer had to pay for the box, for which, if returned, the money was refunded to him. But it was found that this system was very inconvenient to all the three persons concerned—the producer, the consumer, and the middle man; hence, of late boxes made of more slender material have been used, and reduced to such a low figure that it is not taken into account in the sale of the fruit, but the box is, as it were, thrown into the bargain, and is not to be returned. A great many cherries are still sent in chests. As to which way the cherries should be sent seems to be more a matter of taste than anything else. Each method has its advantages and disadvantages. The packing of cherries is different from that of any other kind of fruit. There are two methods, according as the common boxes or boxes in chests are used, but both aiming at the same end, namely, to prepare the cherries so that the top layer shall be in rows across the box, and so that no stems shall be in sight. In the case of the single boxes, the method is this: When the box is put together the side which is the bottom of the box, is left open, the top side closed. One layer of cherries is then laid one by one over the box, with the stems upward—care being taken to place the fruit in rows, pressing them close together; the rest of the box is then filled in without order, but pressed as solid as possible, consistent with not mashing them. This latter is necessary, since the jolting which the box receives in transportation, will otherwise disarrange the first layer, by causing the cherries beneath to settle. All this being attended to, the lid is put on and solidly nailed down, and the box turned over, which is its natural position, for, in this position, if the top lid be taken off, the first layer alone will be in sight, and will present a fine appearance. In the other case, where we have small boxes with only the bottom nailed up, the top remaining open, a device is resorted to: a tin box is made which will just fit inside the boxes to be filled with cherries. In this the fruit is packed the same as above, the wooden box is placed upside down over this tin box, they are then both turned over together, and the tin drawn out, leaving the cherries standing in the wooden box, the same as in the first case. To some it may appear strange that such care should be taken about such a seemingly trivial matter, yet the persons who do this do not do it for nothing. It is strange, but nevertheless true, that people prefer to eat that which to their eyes has a fancy appearance; so much so, that if we have two lots of cherries, of the same kind, of the same size, flavor, etc., but one packed as we have described, and the other not, the first will sell for several cents more per pound than the second.

The cherries are now sent to market, all being sold by the commission men, each orchardist sending all his fruit to a particular one, who sells it and takes out of the proceeds eight per cent as his pay. As much has been said of late against the so-called "middle men," we cannot pass them by unnoticed. Many people have complained of the system, and their arguments are certainly well founded. They say, and truly, that the consumer pays much more for his fruit than the producer receives. For instance, a man who has cherries to sell gets ten cents per pound, while the consumer pays fifteen cents—the difference goes to the profit of the retailers. Now this certainly does not look fair, but yet there is certainly some good as well as evil resulting from it. It is nothing but a case of the division of labor. In most places the farmer raises his produce and then drives with it to town to sell it; here he stays at home and hires some one to sell it for him. By this means he has his undivided attention to devote to his fruit, and its quality will naturally be thereby improved, and it certainly has been so improved.

The following list comprises about all the cherries in general cultivation in this State, not including those varieties which have not met with general favor among orchard men:

Black varieties—Black Tartarian, Black Eagle, Black Hawk.

Dark red varieties—May Duke, Arch Duke.

Flesh-colored varieties—Royal Ann, Bigarreau, Governor Wood, Graffion, Elton, Kirtland's Mary, Red Jacket, Vanskike.

Of all these the Black Tartarian is preëminently the best; as for the rest, it is hard to tell which is the best. If it was a good bearer the Royal Ann should always be preferred; it is the largest cherry produced and is very hard, especially suited for shipment to places far distant. It has been sent to New York and received in good order. The Black Eagle and Black Hawk are very prolific but small in size. The Bigarreau is prolific and of medium size. The Governor Wood is very similar but a little harder. Both are subject to cracking open whenever there are very late Spring rains. The Graffion is a good cherry, but like the Kirtland Mary, is not prolific in all places. The Elton is a white, heart-shaped cherry, above medium size, but unproductive. The Red Jacket is very productive, but not as fine in flavor as many others. The May and Arch Duke are both very productive, but must be ranked among the low-priced cherries, being too soft.

IRRIGATION IN LOS ANGELES COUNTY.

IRRIGATION IN LOS ANGELES COUNTY.

A convention of delegates, to consider water development, and distribution for agricultural purposes, with the view of forming a basis for legislative action during the coming Winter, was held in Los Angeles, at ten o'clock A. M., Saturday, twenty-fifth ult. Geo. H. Peck, of El Monte, called the meeting to order. On motion of Governor Downey, General Geo. Stoneman was called to the chair; Geo. H. Peck was chosen Secretary.

General Stoneman, in stating the objects of the convention, remarked, that whilst many delicate questions which might come up should be discussed with forbearance, they should, in order that the community might escape many pressing great future evils, be decided at once.

On roll call, the following delegates responded: From Anaheim, W. R. Olden; Asusa, John T. Gordon; El Monte, George H. Peck; San Antonio, W. T. East; Los Angeles, Wm. Workman and John G. Downey; Compton, Alfred Higbie; Los Nietos, E. B. Grandon; San Gabriel, Geo. Stoneman; San Gabriel Mining, H. C. Roberts; Silver, J. W. Venable; Wilmington, Phineas Banning.

On motion of Governor Downey, Frank Howard, Esq., was received as a delegate from Los Angeles, in place of Hancock Johnson, Esq., absent.

Ex-Governor Downey then read an interesting and instructive paper, setting forth his views on the subject of irrigation as follows:

EX-GOVERNOR DOWNEY'S VIEWS ON THE SUBJECT OF IRRIGATION.

Having been appointed a member of the committee to suggest means to increase the supply of irrigating facilities in this county, I submit the following views with all due humility as I approach this subject, of so much importance to Los Angeles County and the people of the whole State, with a degree of fear that individual interests will clash with any system that may be proposed for the general good. First of all, the paucity of rainfall renders irrigation a necessity for the greater part of our lands. Secondly, as a fertilizer, it perpetually renovates our fields, as the waters carry in solution nearly all the elements required for the organic composition of vegetable life. Thirdly, it enables the farmer to select his time of planting and harvesting; and, fourthly, it enables him to destroy the numerous pests that infest his soil, in the shape of squirrels, gophers, rats, etc. I do not propose to deprive any man of the use of water that he now has, nor do I think that any Legislature would attempt to legislate away any rights vested or acquired; but, for the good of the whole State, I suggest that the Commonwealth assert its jurisdiction over every stream in the State, and enact such equitable laws as will extend their usefulness to their utmost capacity. The riparian rights, or proprietary rights, maintained in England and recognized in many of our States as the law governing rivers and streams, do not apply to California. The laws of Spain and Mexico retained these in their sovereign capacity, and the State of California falls heir to this precious inheritance for the benefit of its citizens. It will be seen by an examination of the eight hundred and odd grants made to citizens of this State by those governments, that this right is expressly reserved to the nation as public *servitudis*. If, then, our Legislature assumes its proper jurisdiction, it will be no stretch of power to prescribe the mode and manner of the distribution of this important element, and settle at once a subject that has given so much annoyance.

The law of proprietary rights existing in England was once the law of France and the other continental communities, but Louis the Fourteenth had the wisdom to see that it was embarrassing the welfare of the nation, and that wise monarch caused the nation to assume exclusive control of the arteries of the *nation's* wealth, and his example has been followed by others. The Republic of Chile has done likewise, and to this fact the beautiful system of irrigation of Chile and Lombardy is indebted.

There is, without doubt, sufficient water passing annually through this valley, under proper management, to irrigate all the land between the mountains and the sea. Individual communities and settlers have neither the means nor sagacity to utilize it, and therefore the State should step in and say how it shall be done; whether the State can do it through its proper officers, or how companies, under proper restrictions as to charges, shall do it, there should be no water allowed to run down to the sea in Winter unutilized. It should be carried in a thousand conduits through the valley, and, rain or no rain, we should irrigate our lands in Winter, thus destroying the vermin that honeycomb our subsoil, and that destroy and break capillary attraction. If we thus throw into our land an additional number of inches of water and break the surface as soon as a team can walk over it after irrigation, we will, with any ordinary rainfall, secure an abundant small grain crop, and keep our lands *forever* renovated. Our streams must be sheet piled to the bedrock, at points where they emerge from the foothills, so as to bring their full flow to the surface, and then main ditches ramified from the dam in wood, cement pipe, or sheet iron, or earthen pipes. The loss from evaporation and absorption is so great that our slovenly open ditch system will not serve our purpose.

It is unnecessary to review the practice of Egypt, Babylon, and Syria to show what irrigation did for those countries, nor to allude to the perpetual renovation of the Valley of the Nile from natural and artificial irrigation. We have only to refer to the productiveness of comparative sandhills here in this county, that have produced the same crops for seventy years in succession without the aid of manure, and owe this to the ever-restoring qualities of irrigation; we refer to England, Ireland, and Scotland, that have a humid atmosphere and an average rainfall of twenty-seven inches per annum, and that have called in the aid of irrigation as a restorative to their lands, and made their meadows yield ten tons of hay per acre, when but one ton could be produced before. It must be borne in mind that our ditches should always be kept full, that we should keep our dams always in repair, that tree planting and vine planting cannot be successfully carried out unless your ditch is ready to run behind you, and that it is no time to be called on to go to work on your ditches when you should be plowing, planting, and seeding, and that if you neglect this you will all want water at the same time, and cannot possibly procure it. All who have the good fortune to have artesian wells should have reservoirs; if not, they are of but little use, and are only a willful waste of a gift of Providence, to be swallowed in the next squirrel hole, or a nuisance to impede transit, or devitalize some flat that would otherwise be productive.

The Legislature should take bold ground on this subject, and compel well owners to put on taps or build reservoirs, to be called upon at the proper time to perform their part in adding to the general wealth of the State. It is a rational conclusion to come to, that if every man who bores a well and suffers the flow to be carried off by our trade winds, perhaps to the Valley of the Mississippi, we are the losers, and the fountain of supply will be exhausted. This suggestion may look like interfering with the private rights of citizens, but the maxim that partial evil is universal good comes in, and that every civilized man must surrender a portion of his natural liberty for the good of society, is also a maxim well understood and happily appreciated in this Republic.

It will be found that after Winter irrigation is practiced thoroughly in our valley, our land will require less water every year to produce a crop. It will pack the soil or bring the particles of earth in immediate contact with each other, the capillary tubes will be perfected, and the current from the lower to the surface moisture will be maintained. Any observant man can see the rapidity with which our soil dries in any year that the rainfall is insufficient to reach the lower moisture; the cause is, the dry strata between break the tubes, and the myriads of holes make a perfect honeycomb of the intermediate strata, thus completely preventing the rise of the moisture from below.

There are but few localities in this county that water cannot be had in from eight to thirty feet from the surface. Surely, then, any man can contrive means to water ten acres in trees with a simple lift pump, windmill, or horse power, and those who can afford it, could have an Erricson engine, which is the cheapest and simplest means in which the agency of heat is brought to bear as a power. It can be started in the morning with a basket of chips or corn cobs, the door closed on it, and when the fuel goes out, the engine stops its work, and there is neither danger nor trouble attending it. We should all have tanks and reservoirs, for when we want to use our water, we must have it in a greater body than a pump or even an artesian well can supply it. Wherever there is a natural depression on our lands, or a ravine, we should throw an embankment across it, and construct our ponds. They will be our greatest wealth, food for ducks and geese. You can raise your own fish, and these ponds will be found better than any manure pile, with the great advantage that its own gravity will distribute it on our fields without the aid of cart or shovel, only requiring intelligent direction to guide it in its mission of good. Every owner of an artesian well has the power at hand to drive hydraulic rams; they are the cheapest motive power in existence, and nearer perpetual motion than any contrivance yet invented. They are always in repair, and can be used to raise the flow of your artesian wells to elevated tanks and reservoirs, which will enable the farmer to utilize his high or elevated slopes, and supply the economy of his chambers, kitchen, and barnyard.

Some of the ideas advanced may seem bold and novel, but when I first advanced the idea in my annual message, eighteen hundred and sixty-one, to the Legislature, that stock raisers had a coequal obligation to prevent trespass as the cultivator to defend, it was looked upon as equally novel and bold; the result, however, shows that land never assumed value, nor stock a price, in this county, until it was adopted, although some of my best friends denounced it as wild and visionary.

I have given this subject of irrigation much thought; I have had much experience in the distribution of water; I have had friendly litigation as riparian proprietor, with my good friend ex-Governor Pico. Fourteen years ago he had a few straggling Sonoreños cultivating, perhaps, in all, one thousand acres, and I could not obtain water below him to irrigate sixty acres; he declared there was not water enough for himself. There are now twelve thousand acres in cultivation on what was then my farm, and with proper management we can irrigate to the sea with the same supply that then existed. The same example will apply to the Los Angeles and Santa Ana Rivers. That it requires bold and comprehensive legislation will be apparent to all thinking men; that American citizens will submit to any equitable law, passed by the Legislature for the preservation and just distribution of the waters of our rivers and streams, their history in the past will warrant.

That the time has arrived for legislative action to be taken is patent to all, and that it should be general, and properly guarded, is manifest from the general voice of the whole people.

Respectfully submitted, by your fellow citizen,

JOHN G. DOWNEY.

The following preamble and resolutions, introduced by George H. Peck, after discussion and slight amendments to harmonize conflicting views, were adopted in open convention, to Article II:

WHEREAS, In our rivers and mountain lakes there is a large amount of water not utilized, which, if properly developed, would irrigate a large area, and thus greatly enhance the taxable values of our agricultural lands; and,

Whereas, our mountains are pierced with numerous and convenient cañons, which, it is believed, may be dammed and used for reservoirs, and the river streams which sink may be saved by submerged dams, or stone-lined ditches, made into river beds, and flowing thence into reservoirs, and from thence distributed over a large territory; and,

Whereas, the agricultural, riparian, and common law and water rights have been, are, and must continue to be, violently antagonistic and provocative of constant litigation, personal and neighborhood quarrels, all of which must be exaggerated and aggravated with an increased population; and,

Whereas, the public are prevented from using a large proportion of their own water by pretended claims of individuals, which is against public interest, the spirit of our institutions, and not to be tolerated; and,

Whereas, the individual policy has never been, nor can ever be equal to properly managing this great question, which is of State, if not of national interest; therefore, it is

Resolved, by the delegates appointed at the mass convention held at Gallatin, October ninth, eighteen hundred and seventy-three, to meet at Los Angeles, October twenty-fifth, eighteen hundred and seventy-three, to consider means for developing and distributing the waters of Los Angeles County for agricultural purposes, with the view of furnishing a basis for legislation during the coming Winter, as follows:

ARTICLE I.

SECTION 1. That it is the positive duty of the State of California to possess and control all the waters in the State which may be used for irrigating (except springs rising on private lands) without delay.

SEC. 2. And, where ownership of water is exercised to the public detriment, except in the case of springs rising on private land, to provide for denouncing and paying an equitable value for the same.

SEC. 3. To prohibit the acquirement of private rights to water which may be used for irrigating—except to springs rising on private property, and except as may by permitted under a general water law.

SEC. 4. To declare all waters which may be used for irrigating, including waters from springs after they shall have passed the land owned by the party on which springs may have risen, to belong to the State and to be for the use of the public.

On motion, Messrs. Downey, Gordon, Olden, Howard, and Workman were appointed to consider the remaining resolutions and to report at the afternoon session.

Recess.

At half-past three o'clock P. M., convention reassembled, Governor Downey, in the necessary absence of General Stoneman, was called to the chair. The special committee reported back Mr. Peck's resolutions, with sections added. The report was discussed seriatim and adopted, as follows:

ARTICLE II.

SECTION 1. That it is the duty of the State to employ able engineers to make a thorough examination of our rivers, cañons, etc., and report as to the feasibility of increasing the water supply, and of storing the same in reservoirs, etc., for future use.

ARTICLE III.

SECTION 1. It is the duty of the State to create a new department of the government, to have cognizance of all matters pertaining to water development and irrigation. Said department to consist of:

1. A State Superintendent, who shall be assisted by an advisory Board of Engineers and civilians;
2. One Superintendent for each county where irrigating is practiced;
3. Three Commissioners for each water district;
4. The details necessary to complete the above are most respectfully left with the Legislature.

SEC. 2. Lands irrigable by one stream and its tributaries, to constitute not more than two districts, and, if possible, not more than one.

SEC. 3. Water to be sold in all cases; but irrigators privileged to buy in proportion to acres to be cultivated in that water year.

SEC. 4. Irrigating head to be defined in inches.

SEC. 5. Present water laws to be revised.

SEC. 6. Properly existing water rights, in any contemplated change, should be respected.

Amendment by Mr. Frank Howard.

SEC. 7. That a system of taxation should be devised by which lands to be brought under irrigation can pay the major part of the expense incident thereto, and that the additional taxation raised from such lands should be reimbursed to the extent of the cost of development.

Resolved, That the advancement of the State of California in civilization and material prosperity, will greatly depend upon a proper system of water laws;

Resolved, That a copy of the above be furnished his Excellency, the Governor, and the honorable members of the Assembly, and the honorable Senators, with the request that they will urge legislation as above desired.

On motion, it was further resolved:

1. That his Excellency, the Governor, is especially called to urge upon the coming Legislature the propriety of appointing a special commission, with power to visit all parts of the State, to examine into the above questions, and to report at the earliest practicable moment, in the coming session of the Legislature:

2. That Generals Volney E. Howard and John R. McConnel, and George H. Smith, Esq., be requested to draw a suitable water bill for Los Angeles County, in conjunction with the above named committee, and with our legislative delegation, and that it be done in time for the coming Legislature.

Moved and carried, that the committee of five be subject to the call of its Chairman, John G. Downey, and that George H. Peck be added to the committee.

On closing the convention, Governor Downey said that this was the most important meeting which had ever been held in this county. He congratulated the delegates on the harmony and good feeling which they had exhibited. He felt assured that this meeting would produce most happy results.

WOOL REPORT FOR THE YEAR 1873.

WOOL REPORT OF E. GRISAR & CO.

FOR THE

YEAR EIGHTEEN HUNDRED AND SEVENTY-THREE.

Receipts at San Francisco.	Bags.	Pounds.
January	877	
February	257	
March	877	
April	12,516	
May	23,636	
June	9,814	
July	5,406	
August	5,026	
September	11,109	
October	19,557	
November	6,021	
December	1,500	
	96,596	
Of which there was Spring wool 55,981 bags		16,499,880
Spring, shipped direct from the country		1,149,639
Spring, bought direct by country factories		400,000
Total Spring production		18,049,519
There was Fall wool received, 40,615 bags		12,590,650
Fall, shipped direct from the country		200,000
Fall, bought direct by country factories		115,000
		30,955,169
Pulled wool, shipped from San Francisco		1,200,000
Total production of California		32,155,169
On hand, December 31st, 1872		1,500,000
Received from Oregon, 8,770 bags		1,666,300
Foreign wool received, 3,614 bags		973,522
Foreign wool on hand, December 31st, 1872, about		500,000
Grand total		36,794,991

The weights given are gross. The actual tare on bags is about thr pounds each; on pressed bales, fourteen to eighteen pounds each.

COMPARATIVE RECEIPTS AT SAN FRANCISCO.

	1873.	1872.	1871.	1870.
Spring	16,499,880	13,550,980	13,134,680	12,847,700
Fall	12,590,650	8,368,488	9,052,508	6,624,900
	29,090,530	21,919,468	22,187,188	19,472,600
Oregon	1,666,300	1,175,600	921,000	1,403,970
Total	30,756,830	23,095,068	23,108,188	20,876,630

EXPORTS—DOMESTIC, FOREIGN, PULLED, AND SCOURED.

	Pounds.
Per rail	28,175,668
Per steamers	776,605
Per sail	1,191,780
	30,144,053
Bought here by local factories	3,150,000
	33,294,053
On hand December 31st, 1873, about	3,000,000
Total number of pounds	36,294,053
Value of exports	$6,450,351

Fully two thirds of the wools graded during the past year are A1, the balance is A2 or B. This proportion has been unchanged for the past four years.

The market throughout the Spring season was fairly active, and from its opening the demand was sufficient to prevent any accumulation, although receipts were larger than ever before. Prices gradually advanced, but without excitement. The superiority of the wools last received, as compared with first arrivals, partially accounts for the marked difference between opening and closing rates. Eastern manufacturers, through their agents here, took a considerable portion of the Spring clip.

Contrary to general expectation, the first parcels of Fall wool came to a market lightly stocked. A brisk competition sprang up for the first receipts, and caused a rapid advance in prices. The market continued excited until the financial panic in the East put an end to business. For two months transactions were small and stocks became unprecedentedly large. Within the past month supplies have been much reduced by demand from shippers and local mills, but stocks to-day are nearly three million pounds. There are probably seven hundred and fifty thousand pounds still held in the country by growers.

The high rates which prevailed at the opening of the season caused extensive shearing. In many cases the Fall wool realized higher prices than the Spring clip from the same flock.

The character of the clip has been above the average of several previous seasons. The improvement in length and strength of staple was marked, and the condition of many of the northern wools was light. The southern wools contained less bur, but in other respects were about the same as usual. Careless handling in shearing detracts from their value. More attention to this matter was paid by the northern wool growers, and rejections of unmerchantable wools were smaller than usual.

The condition and staple of the Fall clip have been the best for years. The proportion of lambs' wool was large, and its superiority to the lambs of eighteen hundred and seventy-two was marked.

Examination of the preceding statistics shows that the rate of increase in the production of California wools does not diminish as the number of sheep becomes larger. As the more abundant supply furnishes better opportunities for selection, buyers discriminate more closely against faulty lots. Wools of light condition, good staple, and carefully put up are first taken, while those in any way defective move more slowly. Parcels of medium grade are preferred to the high blooded fine and short description. The success which has attended crossing breeds like the Leicester and Lincoln with the fine merino, establishes the fact that in general the wools so obtained are most salable, and therefore most worthy the attention of growers. A more general use of alfalfa would tend to largely increase the production, and enable California to furnish the largest part of the wool grown in the United States. Experience has shown that it is possible to keep twenty sheep in fine condition on the crop from one acre of this grass.

The spread of bur and seed seems to continue, and comparatively little California wool is free from one of these defects.

The condition of the Oregon clip is better than it was in eighteen hundred and seventy-two. The proportion of long wools, suitable for combing purposes, is rather larger. As this class of wool is much wanted, more attention on the part of growers to supply the want would probably be rewarded.

Shipments by sailing vessel since July first, have been larger than usual, owing to the depressed condition of the Eastern markets, and the saving in freight over waters.

GENERAL EXPORTS AND PRODUCTION.

The general exports of the State, as will be seen by reference to our table, have taken unusual proportions this year. The aggregate value of shipments exceeds by ten million dollars that of even the large shipments of last year. This is more particularly due to wheat, which, while not equaling in quantity that of the previous crop, has commanded prices which have raised in value flour and wheat together, to over twenty-one million dollars. England has been almost the exclusive customer for it. This great increase in the value of produce exports has kept exchange in favor of the State, and diminished the demand fo treasure for export. The general condition of the trade has therefor been very satisfactory. It will be observed that the treasure reported in our table embraces only that portion exported from this port, by sea and rail. A considerable proportion of the whole production, which has been given at seventy-two million two hundred and fifty-eight thousand six hundred and ninety-eight dollars, gold and silver, has been exported East by rail, directly from the mines, and does not therefo appear in the statistics of this port. The production has exceeded tha of last year by ten million dollars. Thus the production of wheat and treasure together, exceeds that of the previous year by twenty million dollars, in round numbers, and the result has been an unusual ease in the money market, low rates of exchange, and receipts of coin from the East and transfer through the United States Treasury, of five million eight hundred and ten thousand two hundred and forty dollars.

PRICES IN GOLD OF "A 1" CALIFORNIA WOOL IN SAN FRANCISCO DURING THE PAST EIGHT YEARS.

MONTHS.	1866.		1867.		1868.		1869.	
	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.
January	Nominal.	Nominal.	Nominal.	13 to 14	Nominal.	Nominal.	Nominal.	Nominal.
February...............	17 to 20	Nominal.	Nominal.	13 to 14	Nominal.	Nominal.	Nominal.	Nominal.
March	18 to 22	Nominal.	Nominal.	12½ to 13	16 to 17	Nominal.	Nominal.	Nominal.
April	18 to 21	Nominal.	20 to 22	Nominal.	16 to 18	Nominal.	18 to 21½	Nominal.
May	20 to 22	Nominal.	18 to 22	Nominal.	16½ to 19½	Nominal.	18 to 21½	Nominal.
June	17 to 19	Nominal.	18 to 21½	Nominal.	18 to 19	Nominal.	18 to 21	Nominal.
July	17 to 20	Nominal.	16 to 19	Nominal.	16 to 19	Nominal.	18 to 21	Nominal.
August...................	16 to 18	Nominal.	15 to 18½	12 to 12½	17 to 19	Nominal.	17½ to 20	13 to 15
September	Nominal.	15 to 16	15 to 18½	12 to 12½	Nominal.	13 to 15	17½ to 20	13 to 15
October.................	Nominal.	14½ to 16½	14 to 18	11 to 12	Nominal.	16 to 17	17½ to 20	12½ to 14
November.............	Nominal.	14 to 16	14 to 17	10 to 11½	Nominal.	17 to 19¼	Nominal.	12½ to 14
December	Nominal.	14 to 15	14 to 17	10 to 11½	Nominal.	17 to 19½	Nominal.	12 to 13½

PRICES IN GOLD OF "A 1" CALIFORNIA WOOL IN SAN FRANCISCO—Continued.

MONTHS.	1870.		1871.		1872.		1873.	
	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.
January	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.	19 to 23
February	Nominal.	Nominal.	Nominal.	Nominal	Nominal.	Nominal.	Nominal.	Nominal.
March	18½ to 19½	Nominal.	25 to 26	Nominal.	Nominal.	Nominal.	Nominal.	Nominal.
April	17½ to 20	Nominal.	26 to 28	Nominal.	45 to 50	Nominal.	19 to 21	Nominal.
May	17½ to 21	Nominal.	28 to 32	Nominal.	Nominal.	Nominal.	19 to 21	Nominal.
June	17½ to 21	Nominal.	27½ to 33	Nominal.	30 to 35	Nominal.	20 to 22	Nominal.
July	18½ to 21	Nominal.	26 to 33	Nominal.	33 to 37	Nominal.	22 to 24	Nominal.
August	Nominal.	13 to 16	26 to 32	28 to 32	Nominal.	Nominal.	22 to 25	16 to 18
September	Nominal.	16 to 18	Nominal.	26 to 32½	Nominal.	17 to 19	22 to 25	18 to 21
October	Nominal.	16 to 19	Nominal.	25 to 28	27 to 32	18 to 20	Nominal.	18 to 19
November	Nominal.	16 to 19	Nominal.	23 to 26	30 to 32	19 to 21	Nominal.	17 to 19
December	Nominal.	16 to 19	Nominal.	21 to 25	30 to 33	19 to 21	Nominal.	18 to 20

PRICES IN GOLD OF "A 1" WOOL IN NEW YORK DURING THE PAST EIGHT YEARS.

MONTHS.	1866.		1867.		1868.		1869.	
	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.
January	27 to 29	27 to 29½	21 to 24	20 to 23	18 to 20½	16 to 19	25½ to 27	21 to 22
February	27 to 29	25 to 27	20 to 24	20 to 22	21 to 23	15 to 18½	25½ to 27	21 to 22
March	25 to 27	26 to 27½	23 to 25	21 to 24	21 to 24	17 to 20	26 to 28	21 to 22½
April	Nominal.	27 to 28	20 to 23	20 to 23	21 to 25	18 to 20	25 to 27	19 to 22
May	23 to 26	Nominal.	20 to 24	19 to 22	22 to 25	17½ to 19½	23½ to 26	17½ to 20
June	24 to 27½	19 to 23	20 to 23	18 to 23	21 to 24	17 to 19½	21½ to 23½	16½ to 18½
July	23 to 26	19 to 22	20 to 23	17½ to 19	19 to 23	17 to 20	22 to 25½	16½ to 17½
August	23 to 25	19 to 22	18½ to 21	17 to 19	18 to 22½	17 to 20	22 to 25½	16¼ to 19
September	24 to 27½	20 to 23	19 to 22	18 to 21	20 to 23	18 to 22	21½ to 25	16 to 18½
October	26 to 28	21 to 24	19 to 23	18 to 20	22 to 26½	20 to 23	23 to 26	15½ to 18½
November	24 to 26	22 to 24	18½ to 22	18 to 20	22 to 26½	20 to 23	22½ to 25½	16 to 18
December	23 to 25	21 to 24	18½ to 22	16½ to 18½	……………	……………	22 to 25	16 to 17½

PRICES IN GOLD OF "A 1" WOOL IN NEW YORK—Continued.

MONTHS.	1870.		1871.		1872.		1873.	
	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.	Spring.	Fall and lambs.
January	22½ to 25¼	17½ to 18¾	26¼ to 29¾	22½ to 25½	36 to 41	32 to 36	33 to 40	24 to 28½
February	24 to 24¾	17¾ to 19¼	27 to 30½	22½ to 25¼	37 to 42	32 to 37	30 to 37	21 to 26½
March	24¼ to 26	19½ to 21½	27 to 31½	20¾ to 24¼	40 to 45	33 to 38	28 to 25	19 to 26
April	25½ to 26½	19 to 21¼	27 to 31½	21½ to 24¼	38 to 43	32 to 37	23 to 29	16 to 22
May	24½ to 26¼	18½ to 19¼	29¾ to 33	23¼ to 27	37 to 42	28 to 33	22 to 27½	15½ to 21½
June	26¼ to 27	19¼ to 20¼	31¼ to 38¼	28½ to 32	37 to 42	26 to 31	22 to 27	15½ to 18½
July	23 to 26	19¼ to 19¾	31 to 38¼	29½ to 30¼	35 to 40	24 to 28	22½ to 28	15½ to 19
August	24 to 27½	18¾ to 19¾	32 to 40	26¾ to 31¼	34 to 39	22 to 25	22½ to 28	15½ to 19
September	24¼ to 27¾	18½ to 19¼	30¾ to 38½	28 to 32½	33 to 38	21 to 24	24 to 29½	17½ to 21
October	23¾ to 25¼	18½ to 19½	29¾ to 37½	28 to 32¼	31 to 36	21 to 24	25½ to 30½	20 to 24½
November	26¼ to 27¾	21¼ to 25	31½ to 39½	29¾ to 35	33 to 40	22 to 26	25 to 30	20½ to 25
December	26¼ to 27½	22 to 22¾	31¾ to 40	30 to 36¼	33 to 40	24 to 28	25 to 29½	20½ to 25

EXPORTS

Of leading articles of California produce, together with treasure—exclusive of duties—have, for the past twelve years, been as follows:

	1862.		1863.		1864.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Treasure	....	$41,380,809	....	$46,033,961	....	$55,202,423
Quicksilver, flasks	35,707	1,169,107	26,060	966,748	37 252	1,527,963
Flour, barrels	105,857	675,183	156,099	815,241	128,086	876,393
Wheat, 100-lb sacks	707,463	1,373,336	1,176,086	1,948,646	435,221	771,968
Feed grain, 100-lb sacks	151,944	231,069	130,957	271,315	46,796	112,088
Wool, pounds	5,990,300	1,068,487	5,268,480	1,225,151	5,935,670	1,254,778
Hides, number	321,583	1,033,873	312,439	1,124,156	338,281	1,064,073
Tallow, packages	2,351	77,089	3,043	107,358	1,041	26,474

EXPORTS—Continued.

	1865.		1866.		1867.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Treasure	....	$45,484,546	....	$14,786,577	....	$40,682,990
Quicksilver, flasks	41,256	1,733,283	30,789	1,082,940	28,824	292,726
Flour, barrels	109,210	701,556	327,545	1,855,108	519,428	3,178,598
Wheat, 100-℔ sacks	416,595	847,534	2,258,022	4,185,598	4,604,080	9,340,497
Feed grain, 100 ℔ sacks.	166.027	201,514	481,319	677,120	78,766	82,857
Wool, pounds	6,549,931	1,334,425	4,662,129	897,938	7,057,631	1,143,571
Hides, number	330,361	1,051,317	169,307	546,694	89,693	329,667
Tallow, packages	31	1,038	777	16,311	1,752	29,541

	1868.		1869.		1870.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Treasure	....	$36,358,091	....	$37,287,117	....	$33,618,402
Quicksilver, flasks	43 507	1,330,054	24,365	747,671	12,059	402,051
Flour, barrels	465 273	2,973,538	427,425	2,058,919	221,945	1,179,279
Wheat, 100-℔ sacks	4,071,837	8,635,854	5,011,020	8,734,348	4,197,397	7,974,345
Feed grain, 100-℔ sacks.	86,965	184,578	339,614	384,068	167,920	204,174
Wool, pounds	13,225,181	2,436,594	13,747,791	2,370,165	19,238,000	3,655,000
Hides, number	74,274	282.160	109,165	371,346	102,280	393,873
Tallow, packages	1,898	31,411	387	9,708	....	....

EXPORTS—Continued.

	1871.		1872.		1873.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Treasure	....	$36,332,083	....	$28,085,850	....	$24,223,726
Quicksilver, flasks	11,244	852,125	14,721	875,414	6,169	462,495
Flour, barrels	246,877	1,542,209	1,275,892	1,339,830	473,296	2,861,039
Wheat, 100-℔ sacks	1,311,762	3,185,348	5,859,920	10,331,082	9,120,110	18,476,505
Feed grain, 100-℔ sacks.	18,434	33,850	162,643	217,049	242,198	378,576
Wool, pounds	22,064,638	6,067,775	24,578,980	7,750,000	29,235,376	6,450,352
Hides, number	82,225	346,346	39,818	113,281	25,552	343,099
Tallow, packages	....	....	....	....	....	....

Respectfully, yours,

E. GRISAR & CO.

SAN FRANCISCO WOOL EXCHANGE, January 1st, 1874.

ALFILERILLA, OR FILERE,

AND ITS KINDRED PLANTS.

[From the Rural Press.]

ALFILERILLA, OR FILERE, AND ITS KINDRED PLANTS.

ERODIUM CICUTARIUM, AND ERODIUM MOSCHATUM.

California is justly noted for the beauty and novelty of its native plants. Its flora is no less remarkable for plants that are useful, rather than ornamental. Of the various members of the latter class, none are more widely distributed, more generally known, and more justly celebrated than the pasture plant here described and illustrated.

Alfilerilla, or Fil e-ré, as we really pronounce it, has been ranked in a previous paper as the "prince among our pasture plants," and we think it richly merits this distinction.

Bunch grass, salt grass, from which stock running loose get all the salt they need; tule grass, bur clover, and many other species of clover, both native and introduced; the lupines and various other rich succulent plants, which are lavishly spread in Spring over our mountain and hillsides, our valleys, and our river bottoms, furnish the richest and most varied food for the hundreds of thousands of sheep, cattle, and horses that are annually pastured in our State.

Even when dry and crisp, as most of the plants are from June till December, they are devoured as eagerly and seem as nourishing as the best of hay. Indeed, in many localities, where this native growth is rankest, it is frequently mown and cured for hay. Entirely dried and lacking in substance, as it generally appears, stock feed upon it and are kept in the finest condition during our severest Winters.

Among all our flora, no plant is more valued for such purposes throughout the State, and more widely celebrated, than the plant of which our engraver has given us most excellent likenesses from nature.

Botanically, our *alfilerilla*, or, as we prefer to give it, fil-e-ré, is an *Erodium*, as has been frequently stated in descriptive works on California. This generic name is from the Greek *erodios*, meaning a heron or crane, and is given on account of the close resemblance of its seed-pod and stem to the head, neck, and breast of that bird, as can be readily seen by a moment's inspection. Hence, in works on Botany, its common name is given as Heronsbill, and even Storksbill.

Its California name, *alfilerilla*, is a Spanish diminutive from *filler*, a pin, and literally means *the little pin*. It is given because the long, tapering seed-pod is like a pin. For this reason it is frequently called a pin-plant. Its long and musical Spanish name is reduced by usage to the more convenient form *filere*, in that practical characteristic style which Californians have for finding the quickest and shortest way for doing everything.

This plant is frequently spoken of as a native of the Pacific Coast.

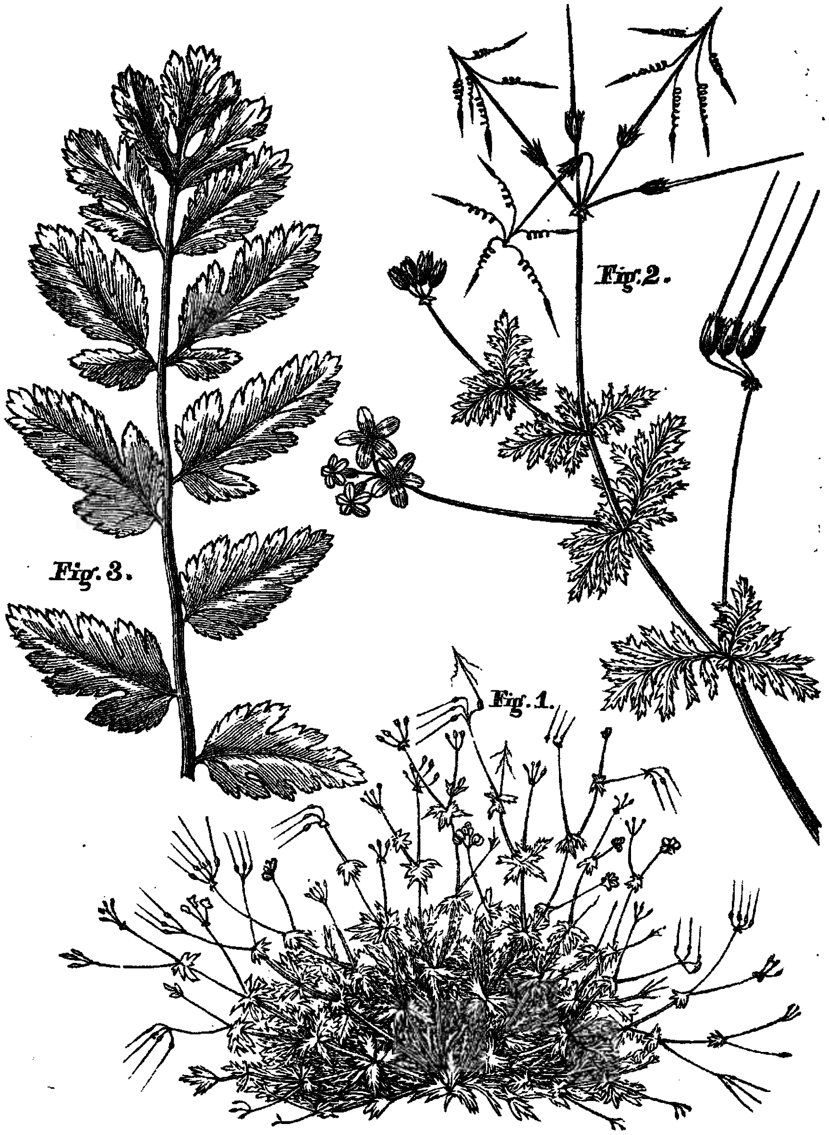
Fig. 2.
Fig. 3.
Fig. 1.

So long has it been known here, so universally is it distributed in our State, and so well does it thrive on its adopted soil, that we do not wonder at this common error.

It is not, however, a native of America. More than forty species of

Erodium are known and described by botanists, and a majority of them are natives of the shores and islands of the Mediterranean. One species is described as a native of Siberia; another, of the Cape of Good Hope; one variety is from Numidia; and the two which are so common in California, *E. cicutarium* and *E. moschatum*, are given as natives of Great Britain.

So, our familiar and valued friend, the filere, is an exotic from the Old World. As a pioneer, it is even more venerable than a "forty-niner." We do not know that history tells us when it first emigrated to its new home. It probably came with some of the first shipments of wheat, and barley, and other seed that were brought to our shores. But like millions of Europeans who have sought homes in America, it has found in California a soil and climate so congenial that it has taken entire possession, and it seems so much at home that we have come to look upon it as among our aborigines. And does this seem strange, when we remember how similar our climate is to that of portions of Southern Europe, Western Asia, and Northern Africa?

Filere belongs to the geranium family, which, besides the sweet-scented and cultivated plants of that name, comprises also the wood sorrels, the balsams or touch-me-nots, and the garden-nasturtium, or *tropæolum*, one species of which (*T. majus*), a native of Peru, is very remarkable for the following fact, which, we are told, was "first discovered by the daughter of Linnæus." At night, its large orange flowers, shaped like those of the larkspur, or snap-dragon, "emit spontaneously, at certain intervals, vivid sparks, like those of an electric machine."

When any of our lady friends are tending their beautiful and valued pets, the rose geranium and its kindred, which beautify their windows, rooms, and conservatories, do they ever stop to think, or have the time to learn, why this plant is called *geranium?* You know there is a reason for everything. This name and *erodium* are given for very similar reasons, as seems natural when we think of the close relationship of the plants to which they belong. Geranium is from the Greek word *geranos*, a crane, and the name is given because the seed-pod bears some resemblance to a crane's bill. For this reason, cranesbill is a common name of the geranium among botanists.

In the engraving, Fig. 1 represents an entire plant of *E. cicutarium*, very much reduced from its natural size, in order to give those unfamiliar with it, a correct idea of the general appearance of this noted plant. Fig. 2 represents stem, leaves, flowers, seed-pods, and seeds, with their spirally twisted filaments, of this species, in their natural size. Fig. 3 is a natural sized leaf of *E. moschatum*.

The striking difference between the leaves of the two species, gives to the former the common name of *fine-leaved filere*, and to the latter, *coarse-leaved filere*, by which our people most generally distinguish them.

The excellent object-teaching of the engraver makes any attempt at a minute description of these plants unnecessary. We will, therefore, point out only a few of the different qualities which distinguish the species. A strong odor is a mark of these plants, as it is of other members of the geranium family. Mash the stem and leaves of fine leaved filere, and they emit the odor of parsnips very decidedly. Coarse leaved filere, besides having coarser and rather shorter stems, leaves closer together and rather smaller flowers, has also a very strong odor of musk. Hence its specific name—*moschatum*, or musky.

The name *cicutarium*, from *cicuta*—meaning hemlock—is said to be given to the first species, because its leaves are finely divided, like the leaves of that notorious plant. But we must confess it is not altogether agreeable to associate in any way with so nutritious and attractive a plant as is this general favorite, an herb, like hemlock, so repulsive from its poisonous qualities, and with so black a historic record, if for no other reason than its being made an instrument of death for one of the noblest of philosophers, by the sentence of his unjust and misguided accusers.

The flowers of both of these species are of a delicate pink or rose color. Each has a five-cleft calyx, five petals, five stamens, and produces five-barbed seeds, like the seeds of spear grass. The appearance of these seed, when matured, and the manner in which they are attached to the stem supporting them, is well indicated by the engraver.

The tendency to twist, especially when exposed to the heat of the hand or sun, seems to be a means which nature has provided to enable the seed to force its sharp points into loose soil and plant itself.

After a wet Winter filere grows very rank on soil of any strength. It sends out branches two and even three feet long, and form a very dense herbage, which makes the best of wild hay. Its stems are full of mucilage, and Indians are said to eat them with evident relish.

These two are the only species of filere that the writer has been able to detect in San Joaquin Valley.

Possibly we also have a variety of *E. cicutarium*, called *hipinnatum*, because its leaves are very finely divided. Loudon says the latter variety is a native of Numidia. We may also have in some portions of California the species known as *E. romanum*, so called because it is a native of Italy. Some species may have been introduced into California by the early Jesuit missionaries. Future research will show whether we have other species. The filere is one of our earliest plants to flower, and one of the latest to remain green.

Let us try to make clear this bond of union among plants which would otherwise seem far removed from each other. We will not say at variance with each other, for, in the world of flowers, almost a universal harmony prevails. To have this tie understood, we must again call attention to the stamens of flowers, which, as we have previously explained, are the male members of the vegetable kingdom.

Look at the stamen of any flower, and you will find it consists of three parts, viz: a single thread or stem, called the filament; at the end of this a knob of various shapes, called the anther, and on this anther a fine dust, or pollen, the fructifying power of plant life.

Now in all this class of plants just enumerated, and the members of its families are counted by thousands, the filaments of the stamens are more or less closely united at their bases in one body, and they encircle in various ways the pistils, which, you know, are the female members in the world of flowers.

All these plants Linnæus combined in his sixteenth class, and called it *Monadelphia*, from two Greek words, meaning one brotherhood.

In this brotherhood is one of the most noted trees in the world, the baobab or monkey-bread tree of Africa (*Adansonia digitata*.) Its leaves and flowers are quite similar to those of some kinds of passion flower.

On the banks of the Senegal specimens of this tree are now growing which many naturalists believe to be the oldest trees in the world; certainly as old as our giant redwoods, perhaps older, they say. According to the best means of calculating known to the botanists, the age of one is estimated at over six thousand years. Yet they do not attain a great height. About sixty feet is their maximum. Their breadth is immense in proportion to their height. The estimated diameter of the largest is twenty-five feet. Some trunks are not more than twelve or fifteen feet high, with an estimated circumference of sixty or seventy feet. Their branches, like huge trees, are forty or fifty feet long, with their smaller branches touching the ground. Some of their roots, exposed by the washing of the river banks, are more than one hundred feet long. Their fruit is gourd-shaped, from nine to twelve inches long and four inches in diameter, of a pleasant acid taste. Hence, a common name for this tree is sour gourd. This tree fills, in the household economy of the Africans of Senegal, almost as important a place as the reindeer does for the Laplander and Esquimaux. While the fruit furnishes a refreshing and nourishing article of diet when ripe, they also make of this gourd various vessels for domestic use. From its bark they make thread, and ropes, and cloth. From the latter these dusky savages clothe themselves and families, and very economically, too, on account of the small amount of material needed to meet the size of their patterns. When food is scarce they eat the small leaves. With the large ones they cover their houses. With the ashes of the leaves they make a very fair soap. Both leaves and bark are used medicinally.

Such is this great Linnæan brotherhood of plants to which our humble and beautiful filere belongs. This principle of oneness, discovered by Linnæus, can, then, unite by a common tie plants so remote in place, and seemingly so unlike in nature, as to include in the same vast family our simple pasture plant and the odd monkey-bread of Africa.

SAN JOAQUIN VALLEY, January, 1874.

CULTURE AND MANUFACTURE

OF

RAMIE AND JUTE IN THE UNITED STATES.

DEPARTMENT OF AGRICULTURE,
WASHINGTON, December 11th, 1873.

Within the last few years the Agricultural Department has taken much interest in the subject of ramie and jute, the seeds of which were originally introduced by it into the country and extensively distributed in the Southern States. The effect of this has been to make the impression that the cultivation of these plants is about to become one of the most important industries, and especially valuable because it will give a profitable employment to the planters and lands of a portion of the country where a larger production of cotton so lessens the price as to make any new production desirable.

Experiments lately made in the State of Louisiana in the cultivation and preparation of both ramie and jute seem to settle the question that it is both practicable and profitable. The Department has sought to gather all the information which can be gained on the subject; and, at its instance, a treatise has been prepared by Emile Lefranc, of the "Southern Ramie-Planting Association," whose experience, both in the cultivation of these plants and preparation of their fibers, enables him to speak confidently of the success that company has met with.

Although it is the purpose of the Department to publish this information, with plates and drawings of the machinery used, in the forthcoming annual report, yet the Commissioner deems its earlier publication so important, in anticipation of the approaching planting season in the Southern States, that he takes this mode of putting it into the possession of planters who may be disposed to prosecute this industry.

FREDK. WATTS,
Commissioner of Agriculture.

RAMIE AND JUTE.

[By EMILE LEFRANC, of New Orleans, Louisiana.]

RAMIE.

At last this remarkable textile plant is enabled to leave the harrassing and expensive phase of experimental struggle; it can now safely enter into the broad and rich sphere of productive cultivation, and open a new source of prosperity in the industrial area of the New World.

It has just been delivered from the heavy impediments which have, so far, prevented its useful development.

After having been the object of years of laborious and costly efforts in many quarters, and by many searching minds, the arduous problem of separating, economically, that fine textile from its green coating, has been satisfactorily solved in New Orleans. The difficulty of applying the proper treatment to the fiber is now radically removed by the completion of an improved decorticating machine, patented in eighteen hundred and seventy, and finally perfected in eighteen hundred and seventy-three, that is to say, a few months ago.

The machine was put publicly in operation last September, on the farm of the "Southern Ramie-Planting Association of New Orleans."

It has worked for weeks in the regular decortication of ramie and jute in green stalks. Undeniable evidence has been there furnished of the long-sought-for discovery of a successful method for setting free the rich fiber from its tenacious bark and pithy envelope.

Introduced into Louisiana toward the Fall of eighteen hundred and sixty-seven, the ramie has had ample time to prove its vitality and toughness as a perennial growth. With little or no care it has thriven alone since then, and wherever attention has been given to it its propagation has been considerable. In some rich and elevated soils the plant has stood and propagated without the least cultivation for the last six years. The stems die in Winter, and multitudes of others shoot forth every Spring. Where the bushes are regularly cut, three or four times a year, the more vigorous and luxuriant is the growth. All these facts sufficiently prove the perennial and hardy vitality of the plant, as also its adaptability to our soil, and the congeniality of our climate. Therefore the agricultural problems and the questions of acclimation are also solved and settled. If the ramie industry did not unfold sooner the advantages of the plant, it was solely on account of the unprofitable or inefficient methods of extracting the fiber. When first introduced on this continent, the treatment of the ramie plant was erroneously assimilated to that of the nettle family. The universal opinion was that it should be treated like jute, flax, hemp, and other textiles of the cannabis variety, which are disintegrated lengthwise from the stems by the simple process of water fermentation.

The error was soon discovered. Ramie fiber admits of no rotting action on the stalks. Steeped and fermented in water, or exposed to the air, it is decomposed and reduced to a short and weak fiber, saturated with tannic acid and spotted with tan bark. Moreover, the process is tedious and anti-economical. It has been found that the envelope of the ramie fiber contains some sulphuric and carbonic elements, which dissolve the joints of the cellulose when the stem is subjected to the acetic degree of fermentation or rotting. Then, some chemists resorted to the process of neutralizing those dissolving elements by means of an acidulated bath for the plants.

But those different systems were of no avail, because they required the additional intervention of machinery to break and hackle the filament, which was otherwise more or less injured in its quality by the unnatural treatment to which it was subjected. In face of the despotic exigencies of economy in labor, and the absolute necessity of a large production, none of those methods was practicable.

But another road lay open to logical and searching intellects. They were guided by the investigation of the following points:

First—What is the process of the Chinese, who for centuries have monopolized the ramie fiber trade? Their process consists in stripping the ramie plant and scraping the bark containing the filament.

Second—Why do they not proceed by rotting the stalks as they do for their other long textiles? Because they know that the nature of the ramie plant does not permit it. They are aware that this fine fiber can only be obtained by separating first the injurious bark, which, being removed, permits the ordinary process of rotting and bleaching on the uncoated and free filament.

The questions being so propounded and answered, there was but one way to solve the problem—to construct a machine capable of doing what the Chinese do by hand. They skin the stalk and clean the outer bark off with a knife, and each hand obtains in this manner one or two pounds per day of a marketable raw product. A machine had, then, to be invented that would supply daily one thousand pounds of a similar product. Such was the task, and it has been accomplished!

But inventions of that kind, with no precedent, no basis in existing machinery, are not the work of a day; they are the result of years of persistent experimentation and concentrated thought.

Sound and useful contrivances have ever been of slow growth. It seems that a certain experimental and painful stage is the necessary tribute paid in advance to the benefits of progress.

Practical persons, familiar with the treatment of textiles, know the impossibility of cleaning thoroughly any fiber, dried or green, by the continuous action of machinery. Either with drums or beaters the cleaning instruments cannot turn out the filament without a certain quantum of chaff and other refuse entangled in the fiber. All experiments on this point have failed, and proved the insuperable difficulty of expelling by continuity of friction all the particles of pith that have penetrated into the fiber. It is only through a scraping process, acting in a backward and forward direction, that a perfect cleaning can be obtained.

The contrivance that cleans ramie, and furnishes a product similar to that of China, is founded on that true principle, as follows:

Revolving cleaners, provided with a peculiar sort of knives, receive gradually, by means of a circular carrier, bunches of stems, which are doubled down and hooked in the middle. The carrier withdraws them from the rotary action of the cleaners, and delivers them in the form of clear ribbons, of a light yellow color, as fine as the imported China grass.

That crude ramie staple is worth from sixty-five to seventy pounds sterling per ton in Europe, but American manufactures offer twenty or twenty-five cents a pound for it, provided a large supply be secured. On account of the aforesaid difficulty of decortication by machinery, it has hitherto been impossible to comply with this condition, and consequently the cultivation of the plant has remained stationary in America. This impediment is now about to disappear, and a flourishing trade will no doubt be soon inaugurated. Then there will be no reason for confining the value of the fiber to what it is worth in its crude condition. Properly ungummed and bleached by the process hereafter described, ramie fibre acquired a double and triple market value. Then, if dressed and combed smoothly, it has the beauty and value of a lustrous staple which is classed next to silk for strength and brilliancy. The tissues called "Japan silk," "Canton goods," "grass cloth," "Nankin linen," and many other varieties of dry goods, are generally made of ramie material, more or less mixed with other fiber.

English manufacturers have monopolized the ramie or China grass trade in Europe and America, and kept somewhat secret the process of finishing and weaving the fiber. Almost all the dress goods—mixed with brilliant materials and imitating silk fabrics—are made in part of ramie. Leeds and Bradford are the principal manufacturing centers that use that staple as a substitute for silk in many sorts of goods. It is a common error to consider ramie as a substitute for cotton.

None of the Bohemaria or Urtica grasses have the necessary requirements for dethroning that useful king. The effect produced by the ramie fiber is cooling rather than warming, and it cannot, for that reason, take the place of the indispensable cotton staple. Flax will, perhaps, feel its competing influence, because the ramie tow, called cottonized ramie, enters into the manufacture of fine linen and cambric imitations. But the long ramie staple has a higher destiny; it is in the rich domains of the silk trade that it will predominate as an ally more or less officially recognized. Like certain sorts of wines, such as champagne, port, sherry, Madeira, and others, whose consumption exceeds considerably the genuine produce, the so-called silk products greatly surpass in volume the actual amount of silk that could be obtained from all the cocoons of the whole world. Evidently there is some precious substitute more or less openly introduced into the pretended silk stock. What is this contraband material? Lancashire and Lyons manufacturers could probably answer the query. But, resorting to no such indiscreet question, we can derive some light and information from the following figures of the Eastern exporting trade. In a pamphlet recently published on the subject of ramie by Baron Jean de Bray, we find that the export of China grass from Shanghai alone amounted in eighteen hundred and sixty-five to three million two hundred and forty thousand kilogrammes—about seven millions of pounds. It is reasonable to infer that this exportation has increased ever since, and that India and Japan have furnished also to the outside trade a certain share of the staple. Whatever may be the consumption now, it is certain that the demand for this fine article will for a long period exceed the supply. The limited surplus over and above the home consumption of the crowded populations of Asiatic countries, has been a drawback to the diffusion of ramie in other parts of the world. The cleaning process of the Chinese permits to each hand an average of only one and a half pounds a day—hence the limited production.

It is a well known fact, that if American manufacturers have not yet displayed their usual enterprising spirit and ingenuity by availing themselves of the advantages without number offered by the ramie, it is because they could not secure a regular supply of the fiber. But the decortication of the plant being now easy and economical, its cultivation will receive its due development, and permit our industrial institutions to check the foreign monopoly of ramie goods. We have now on hand all the necessary elements for the rapid progress of its cultivation and production; abundance of plants and roots as acclimated seed; lands and climate perfectly suitable; practical knowledge derived from six years of experiment; and, finally, the mechanical means of harvesting this valuable product.

Having thus exhibited the actual standing of ramie as the element of new branches of manufactures on this continent, and demonstrated, that, instead of being abandoned as a failure, which many thought it was, it has silently prepared its way to success, we deem it proper to state briefly the past status of the plant, and the use made of it by its original producers.

If ramie is a novelty for the New World, it has been in use from remote antiquity in the Old. Japan, China, India, and almost all the islands of the East, have, for centuries, made of it the basis of their home fabrics, and an object of foreign trade. The Greeks and the Romans used, as silk clothing, ramie goods imported from the countries of Southern Asia. Virgil mentions the fact, and admires those rich tissues, in his Georgics. He calls them the brilliant product of the silk countries of the East. Several learned Jesuits, when missionaries in Japan and China, discovered that "this brilliant product," so admired by the Roman poet, was the nettle fiber called "kara" in Japan, "ma," or "chu-ma," in China, "rhea" in the East Indies, and "ramah," or "ramie," in Java. All these denominations, in the languages of the countries producing the plant, have some meaning in regard to the varieties in the nettle family. The generic name of the plant is "Urtica," of the Bohemaria tribe. But in its numerous varieties there are different qualities classed under two principal types: *Urtica nivea* (the English China grass), and *Urtica utilis*, or *tenacissima*, which is the *ramie*. The latter is the better of the two. We have both varieties in Louisiana, and we can confirm Dr. Decaisne's assertion of the superiority of ramie over China grass. Thus *Urtica nivea*, with the leaves green on one side and silvery on the other, is inferior both in productiveness and in quality. Its fiber remains greenish, stiff, and brittle. It is the reverse with the ramie, or *Urtica tenacissima*. It is partly for that reason that the English government of East India promotes, by all possible means, the production of that variety in Hindostan. It is named *rhea* there and ramie here. The Asiatic etymology of the two names corresponds logically to the meaning of "high branches."

Roxburgh in England, Decaisne in France, and the Department of Agriculture in America, are the principal introducers of the plant into the scientific spheres of their respective countries. They have personally verified the industrial value of ramie as the genuine kind of Bohemaria, and recommended its adoption to agriculturists. Decaisne, professor of the Museum of Natural History in Paris, has published a notice, in which he traces the use of the textile in Europe as far back as the seventh century. "Russia," he says, "received it from the Tartars and the Chinese as damask silk; Holland received it from her Asiatic establishments, and trades still with it, under the name of *nettledoeck;* England, under Queen Elizabeth, learned from the botanist Lobel the value of the article, and has since labored to monopolize its trade throughout the civilized world.

In Europe, especially in France, new ideas and discoveries are promptly investigated and sifted out by scientific volunteers laboring ardently to keep their minds in activity, or to have the pleasure and the honor of contributing to the progress and the welfare of mankind. They do there in theory what our Department of Agriculture does here in practice. They study, think, and write, on any agitated subject, and send the result of their mental efforts to some academy or institute, whence it is publicly disseminated throughout the world.

The ramie question has been turned over and over again, for years by writers on industry and economy. Numerous memoirs, pamphlets and books have appeared in the wake of the learned Roxburgh and Decaisne. But few of those publications possess the tangibility of accurate facts, and of practical knowledge. The majority are merely vague repetitions of old reports, and convey no instruction of a solid nature. One of the rare good treatises on the matter is that of Ramon de la Sagra, member of the French Institute. It has been published in the Bulletin de la Société d'Acclimation, of eighteen hundred and sixty-nine, which is similar in its object to the monthly report of the United States Department of Agriculture. That treatise is a clear and reliable exposition of the Chinese methods employed in the cultivation and treatment of the plant; but the writer concludes, in harmony with all those that are properly enlightened on the points in question, that the profitable cultivation of ramie is doubtful in European latitudes, or at al events, not to be attempted until the cleaning can be performed by efficient machinery. In the Union the plant has a wide field and an ample margin in regard to the latitudes congenial to its growth. The Gul States and California have in that respect the requisite qualities, particularly Louisiana, where the plant was first introduced from Mexico in eighteen hundred and sixty-seven, and subjected since to various tests To two persons is due the credit of its introduction into the United States viz: Monsieur Ernest Godeaux, in that year Consul of France, in New Orleans, and Benito Roezl, a Bohemian botanist, once a resident o Santa Comapan, in Mexico. M. Godeaux, who was Consul at Shangha before coming to New Orleans, had brought from China fine white clothing made of "ma." It was remarked and admired by ewery one for its various qualities. Having observed that the latitude and soil o Louisiana could not be uncongenial to the plant, M. Godeaux ordered some ramie seed from China. But it failed to come in proper condition By a curious coincidence Roezl arrived at that time from Vera Cruz with a lot of ramie roots for sale. He had also a few plants growing in flower-pots. M. Godeaux identified and recommended the plant as being the same he had attempted to introduce into Louisiana as a profitable article of cultivation. The Department of Agriculture, then superintended by General Horace Capron, also recognized the identity of that Bohemaria, and officially proclaimed its merits, as the Hon. Frederick Watts now does in regard to jute.

The New Orleans press, the *Picayune*, the *Times*, the *Bee*, the *Renaissance Louisianaise*, etc., studied elaborately the value and utilization of this textile, and recommended its adoption. Roezl sold his roots in small quantities to numerous experimenters, and the initiation of the plant was effected with varied success in different quarters of Louisiana, Mississippi, Texas, South Carolina, Georgia, Alabama, etc. Thus a few hundreds of sickly ratoons, transplanted from Mexico, where a dozen roots had been previously imported from Java, rapidly produced millions of plants in these States. But the vicissitudes of the country, the want of efficient machinery, as also insufficient care and attention, caused the decay of a great portion of this first growth. Louisiana is probably the only spot where the propagation of the plant was maintained. All sorts of experiments on the various points to be studied made the writer of this memoir familiar with the ramie cultivation and its requirements. The successful cultivation of the ramie is not exactly an easy task, as many suppose it to be, nor can the plant adapt itself to any kind of soil indiscriminately, as it has been reported. Experience has demonstrated that a durable stand requires a judicious choice of land and situation, also intelligent and attentive labor at the outset. Bearing in mind that ramie is a perennial growth of great productiveness, which can last for years and years, it will logically be admitted that a selected and well-prepared soil is indispensable to secure the benefit of frequent cuttings and a lengthened stand. Therefore the observations of the following rules will be absolutely necessary for the cultivation of ramie, and for drawing from the rich plant all it can yield:

First—Whether for nursery purposes or for cultivation, the land must be sufficiently elevated to receive the benefit of natural drainage, because the roots will not live long in a watery bottom.

Second—The soil must be deep, rich, light, and moist as the sandy alluvia of Louisiana. Manure supplies the defects in some lands in these respects.

Third—The field must be thoroughly cleared of weeds, plowed twice to the depth of eight or ten inches, if possible, harrowed as much as a thorough pulverizing requires, and carefully drained by discriminate lines of ditches. Water must not be allowed to stand in the rows of the plant.

The land being thus prepared, planting becomes easy and promising. December, January, and February are the best months in which to plant. Roots, ratoons, and rooted layers are the only available seed. They are generally four or five inches long, carefully cut, not torn, from the mother plant. The dusty seed produced by ramie stalks in the Fall can be sown; but it is so delicate, and requires so much care during the period of germination and growth, that it seldom succeeds in open land. The regular germinating power of that dusty seed is also questionable. The Department of Agriculture vainly tried, a few years ago to, diffuse this seminal cultivation by distributing imported seed, which never germinated.

In the presence of these difficulties, and of the sure propagation obtained from fractional roots, sowing has been abandoned, and replanting adopted, as follows:

Furrows five or six inches deep, and five feet apart, are opened with the plow. The roots are laid lengthwise in the middle, close in succession, if a thick stand of crop is desired, but placed at intervals if nursery propagation is the object in view.

The first mode will absorb three thousand roots per acre, but will save the labor of often filling the stand by propagation. The second mode will spare three fourths of that amount of roots, but will impose the obligation of multiplying by layers. Being placed in the furrow closely or at intervals the roots are carefully covered with the hoe. Pulverized earth and manure spread over the root insure an early and luxuriant growth in the Spring. When the shoots have attained a foot in height they are hilled up like potatoes, corn, and all other plants that require good footing and protection from the fermenting effect of stagnant water. The intervals between the rows being deepened by the hilling have also a draining influence, which can be rendered still more effective by ditches dug across from distance to distance say fifteen feet.

Good crops are obtained by thickening the stand. The stems are then abundant, fine, straight, and rich in fiber. Close planting is then necessary, inasmuch as it prevents the objectionable branching of the stalks. Crooked and branchy ramie is unfit for mechanical decortication; it causes waste, and yields an inferior quality of fiber. The period at which the plant is ripe for cutting is indicated by a brownish tinge at the foot of the stems. At that early stage the plant, though greenish yields a fine and abundant filament. It also produces three or four crops according to soil and climate. The first cutting may be unprofitable on account of the irregularity and sparseness of the growth; but if the stand is well razeed and manured over the stubbles the ensuing cuttings will be productive. For that purpose the field must be kept clear of grass until the growth be sufficiently dense to expel the parasites by its shade. That necessary density is obtained by means of the important laying process. This consists in bending down, right and left, along the growing stand, the highest switches, and in covering them with earth up to the tender tip, which must not be smothered. One of the causes of the perennity, and of the vigor of the plant, is the nourishment it draws from the agencies of the atmosphere. Consequently the leaves of the layers should never be buried under ground. When properly performed, laying is very profitable. It creates an abundance of new roots, and fills up rapidly the voids of the stand.

After two years the plants may be so thick as to spread out in the rows. Then the plow or the stubble-cutter has to chop in a line, on one side, the projecting ratoons. If well executed, this operation leads to notable advantages:

First—It extracts roots or fractional plants suitable for the extension of the cultivation elsewhere.

Second—It maintains, as a pruning, a vigorous life and develops a luxuriant growth in the stand.

Third—If always applied on the same side of the row, this sort o stubble-cutting has the remarkable advantage of removing gradually the growth toward the unoccupied land in the intervals, and of pushing it into a new position without disturbance.

That slow rotation preserves the soil from rapid exhaustion, and th ramie from decay, through the accumulation of roots under ground

Of course this lateral plowing will not prevent the opposite row from receiving the benefit of hoeing after each crop. Experiments made in Louisiana have demonstrated the efficiency of the method, to which are due the preservation and propagation of the plant in that State, while it has been destroyed in other sections for the want of similar care.

It is through such judicious methods that the old land of China has preserved sufficient fertility to produce constantly the ramie for many centuries. After each cutting, Chinese planters plow on one side and make cleanly the stand; then they cover it with a thick coat of manure. That maintains the moisture and fertility of the soil, and, at the same time, preserves the plant from excessive heat or extreme cold. That protective system permits in Winter ramie cultivation in latitudes corresponding to those of Maryland and Virginia. It could even be undertaken farther north by another Chinese application.

In some cold regions of the northwestern parts of the Celestial empire, China grass is cultivated like potatoes. Planters dig up the stand every Fall, after the last cutting, and store the roots in cellars to replant them in the Spring; yet they generally obtain two crops by that unfavorable process.

Let us now close this notice with a description of the harvesting operations. As we have already said, the cutting must commence when the stalks, in dense bushes, become brownish at about a foot above the ground.

The American Mower, World No. 1, with the new short blades, will mow ramie easily and rapidly. The reaper will permit the stems to be gathered in sheaves like wheat. Men and women walking behind the mower tie them and equalize the ends. Thus they build them in stacks from distance to distance on the ground. After a few days, the leaves wither and fall under the handling and the shaking they undergo while they are being carried to the machine. Ramie may remain cut from eight to fifteen days, according as the weather is dry or damp, before it is decorticated.

There is also between the first and last degree of maturity a space of time, which leaves a sufficient margin for the harvesting of fifty acres per machine. The yield of ramie fiber per acre varies according to the density of the growth. A plantation with regular thick stands, will produce from four hundred to five hundred pounds of crude fiber per acre, at each cutting.

The process of decortication is simple and easy. The bunches coming from the field, with as few leaves as possible, are placed one by one in succession, in the compressing aperture of the feeder of an endless circular carrier. The stalks brought under the influence of the attractive rotation of cleaners, revolving with great velocity, are crushed at their entry and scraped at their exit, by the peculiar effect of the horizontal carrier, which turns out the cleaned fiber on the opposite side of the feeder.

The yield of the machine will be in proportion to its size and power. The cleaning is incessant if the machine is fed constantly by a quick handling. Its principle offers the facility of such an expansion that the apparatus can be made large enough to clean one ton of fiber per day with a twenty-horse motive power. It is not only to ramie, but also to jute, flax, hemp, and all strong textiles, in green plants, that this new machine can be successfully applied. It is demonstrated by theory and practice, that the textiles extracted in a green state, retain all the natural qualities of strength and color, which lose always fifty per cent by the ordinary process of rotting in stalks. The avoiding of that loss is one of the great advantages of the machine, besides the important economy in labor. Now comes the disintegration of the decorticated fiber.

The yellowish ribbons produced from the plant engaged in the machine are the crude fibers. Albumen keeps them undivided, but being dried in the shade they acquire in that state a marketable value, which will double and triple by subjecting the filament to the bleaching treatment. However, ramie planters need not push so far as the industrial preparation of the product, inasmuch as they can sell it in its raw condition to bleachers and manufacturers, as brown sugar is sold to the refiners. But should they desire to bleach and refine the article, they could do it by the appliance of the ordinary process in use for flax bleaching. The best method is that of Bethollet, which has been the most extensively used. It consists in first steeping the fibers or vegetable tissues in boiling water, and then in rinsing them in a copious supply of water, in order to disengage them from soluble matter. When the water has entirely dropped off, they are plunged into a bath of alkaline lye, which is raised to the boiling point. They are then immersed in a solution of hypochlorite of lime, or an alkaline hypochlorite. The tissues are washed in a copious supply of water, and then immersed in water acidulated by sulphuric acid; washed with soap and water; then rinsed in water and dried. Now, much labor is spared by bringing the chlorite into immediate contact with the fibers washed in hot water and still damp, or by plunging them into a bath saturated with chlorate.

In conclusion, the ramie cultivation for southern planters, and the application of the machine to the operations of the western hemp and flax growers, deserve in every respect, the most serious attention. They contain, undoubtedly, some elements of beneficial improvement.

However, there may be one objection to ramie enterprise in the present financial embarrassment of the country. It lies in the capital required to start a regular plantation. The root seed costs from twenty dollars to twenty-five dollars a thousand, and at least three thousand roots are required for each acre.

That condition may not be accessible to many. At this juncture we have another new, profitable, and cheaper industry to recommend as being within the reach of the impoverished millions of our planting districts. That is the cultivation of *jute*, so warmly advocated during the last few years by our worthy Department of Agriculture. The following notice on the subject of jute will be, it is expected, as the above on ramie, of some advantage to the national interests of the country.

JUTE.

Jute (*Corchorus capsularis*) is a filamentous plant of the *Hibiscus-Malvacea* family. It is a native of Hindostan, and has been used for many years in the textile fabrics of Asia. Its importance as an exportable product dates principally from the cotton crisis created by the war of secession. Then the British trade took advantage of the cotton scarcity to develop the resources of jute as a cheap staple applicable in many European fabrics.

It was largely imported, brought forward as an auxiliary to the existing staples, and introduced into various spun goods. Though it has been proved unfit to take the place of cotton, the numerous experiments then made through necessity have considerably enlarged the area of jute consumption. Millions of bales are now imported and used where only thousands were employed before. It is mixed with other fibers, as wool, flax, hemp, cotton, etc., and causes the remarkable cheapness of certain tissues. A more direct and extensive use to which this long fiber has been put is in the ground of carpets, in oil-carpetings, twines, cordage, sacks, bagging, etc.

The great center of jute specialties is Dundee (Scotland.) There nearly one hundred mills, occupying thousands of hands, work the article into various goods. All over Europe jute is applied in numerous products. Of late years France has considerably increased her consumption of jute. The assessment of the additional tax on imported textiles amounts for jute only to over two hundred thousand francs. Other countries consume it in proportion. England, whose consumption of the article exceeds that of all other countries, has the monopoly of the product through her Eastern possessions, where she has developed its cultivation to an enormous and annually increasing extent. In order to secure for a long time to come the continuation of that important source of wealth for the national trade, the British Government has forced by all possible means the extension of jute culture, even at the risk of a breadstuff scarcity, as is testified by the present famine in Bengal.

Last year a royal commission was appointed to examine the subject of jute cultivation, and inquire into the practicability of extending the production, in order to retain in the hands of the British its exclusive supply to the world. That agricultural industry being in the power of English capital, keeping in a sort of bondage millions of Hindoo producers, jute is for England what cotton is to the United States of America—the commodity which constitutes the principal portion of the national exchange. The Old and the New World are tributaries for enormous sums to Bengal, the principal jute-producing section.

The American trade disburses every year millions of dollars in gold to pay for the manufactured and unmanufactured jute received from Bombay and Calcutta. Though some sorts of canvas are designated in market reports under the denomination of American jute-bagging, there is no jute produced in America. The first trial of a regular jute-culture has just been made in Louisiana.

Desirous of relieving his country from the heavy tribute paid in that respect to India, the Hon. Frederick Watts, Commissioner of the Department of Agriculture, has taken to heart the patriotic task of introducing jute into our agricultural industry. Having obtained from Congress an appropriation for the purchase of some seed from India, Mr. Watts has distributed that seed in the Southern States, and acquired the certainty that the plant can grow and prosper in those having, to a certain extent, some similarity in latitude and soil to the jute districts of India.

Louisiana seems to be remarkably congenial to the plant. Experiments made there on a fair scale have demonstrated, by facts and production, the facility of making jute a very profitable object of cultivation.

The Southern Ramie-Planting Association of New Orleans has planted it two seasons in succession, and by various methods, with the view of testing the adaptability and the yield of the imported seed. It has succeeded remarkably well, and the reproduced seed has proved to be fully as good as the former, and even superior in some cases. It was so well acclimated the second year that it has grown and developed most luxuriantly in the various spots where it has been tried. In general, the domesticated seed has been more vigorous than the seed received from Calcutta. In the parishes of Saint James and Saint John Baptist that prolific plant has attained an average of eight and nine feet in height, with a thickness of growth similar to that of wheat; and in inferior soils around New Orleans it has furnished an average of six and seven feet. That and many other facts conclusively demonstrate that jute finds itself at home in the alluvial and moist soil of Louisiana equally as well as in the old and half exhausted lands of Hindostan.

Texas and Florida have also made successful experiments.

Before describing the mode of culture and of production applied in the experimentations made in Louisiana, let us insert a report from a Boston merchant now residing in Calcutta, who has taken the trouble of examining the jute question. The following is what that gentleman, Mr. N. Goddard Fuller, writes on the cultivation of that plant in India:

"The quantity of jute fiber and seed produced to an acre depends greatly on the richness of the land. It is planted in Serajgunge, Naranigunge, (Dacca), and other northeastern districts, where about four fifths of the total crop is raised; the product is from two thousand to three thousand pounds of jute on an average; in some cases, however, as much as four thousand pounds are produced. The yield of seed is about one thousand to one thousand two hundred pounds per acre. In places, say about fifty miles around Calcutta, the production of which is called dessee, or country jute, the yield is smaller, being only about six hundred to one thousand pounds of fiber, and more seed, say one thousand five hundred to one thousand six hundred pounds per acre; but on rich, damp lands the product is almost as much as in the northeastern provinces. The dessee description was used only for local consumption until about five years ago, when shipments of it to England began, and both the shipments and productions of it are increasing every year. Jute is sowed broadcast, and about twenty-two to twenty-eight pounds of seed is required to an acre. In the northeastern provinces it is planted in February and March, and is cut about the end of June and beginning of July. The dessee is sown in July and August, and cut in August and September. On rich land it grows and ripens quicker. In the northeastern districts, when grown on rich soil, the diameter of the stalk at the bottom is from three fourths of an inch to one and a quarter inches, and the length from seven to ten feet, and sometimes, but rarely, longer and thicker.

"The country jute around cities is from four to seven feet long and one and one half to three fourths of an inch in diameter. The plants are cut about three inches above the ground, excepting dowrah, which is uprooted. The butts are cut at the time of baling the jute for export to Calcutta. When the stocks are cut they have a green bark, which, after going through certain processes, becomes fiber; the planters cannot tell at the time of cutting the stalks whether any or how far from the bottom will be hard. The stalks are cut about a month before the seed ripens, and the poorer plants are generally let go to seed. Jute made out of the plants producing seed is hard and barky; the unripe seed, cut with the stalks, is of no use. It grows best on rich, moist ground, but not on low ground. Castor oil cake is the best for it, and next to that cow manure, but the country planters, as the ground is naturally rich, use no manure whatever. An acre of cotton costs much more than an acre of jute. Jute and cotton do not interfere with each other in the least. Cotton grows in the northwestern provinces, Central and Southern India, while jute is raised in Bengal. The little cotton that Bengal produces, and the little jute that the cotton districts produce, are of poor quality, and only used for local consumption. For the last few years jute has been encroaching on the linseed crop, as the same ground is suitable for both."

It was in the presence of such inciting reports, and of the encouraging counsels of the Department of Agriculture, that experiments were earnestly made in Louisiana. The selection of the soil and the methods of planting were diversified, in order to discover the best applications. The most favorable and economical system, sifted out of these various tests, is the following:

To obtain good fiber-crops the land must be elevated, rich, moist, and well drained, as in India; to raise seed, low lands may be used, provided that favorable weather allows sowing and enables the growing plants to keep above the points of overflow. However, when the growth is fully started, water is not to be feared, so long as the tips remain above the surface of submersion.

In the first case, jute is sown broadcast; in the second, in drills five feet apart. That interval is to facilitate the branching, and, at the same time, the destruction by plowing of the tall weeds which generally occupy low lands. In both methods the soil must be as well prepared as for ramie; plowed as deep as possible in January or February, then left exposed to atmospherical influences until the planting period. That period commences with April, and terminates with June, in monthly succession. To prepare for sowing a second plowing is required, and as fine a harrowing as can be effected. The "circular pulverizer," applied before the harrow, shortens the labor. Then the sowing for fiber-crop is performed broadcast, with a Calhoun sower. With that instrument, costing eight dollars or ten dollars, a man can sow ten acres of jute per day. The quantity of seed required for each acre is from twelve to fifteen pounds. That is amply sufficient, and, if the Hindoos put more in their land, there must be some accountable reason for that excess. Either the condition of their seed or of their land is inferior to that of America, or they are singularly prone to go to waste. We have repeatedly observed that, when the growth is thicker than what is allowed by the aforesaid quantum of seed, some natural destructive agent enters into the stand and thins the space to the limit demanded by the plant. This fact was verified in several spots of jute plantation in Louisiana. Therefore no advantage at all can be derived from prodigality in sowing. The equal distribution obtained by the mechanical sower may account also for the economical difference existing between us and the Hindoo planters, who, having no machinery whatever, do all their work by hand.

The ground being well tilled and the seed properly sown, on wet days if possible, the jute is left alone like wheat. No other care than that of drainage is necessary until maturity.

The cost of that first operation cannot exceed four dollars per acre, if the material is adequate and the management judicious. That expense, of course, does not include the value of the seed, because, after the first outlay, planters will provide themselves with it from the low lands, or from the weak spots of the plantation. In the bottoms, when we plant in drills for seed, a subsequent plowing or two will be necessary in the intervals to neutralize the encroachments of grass. In Louisiana that labor is a necessity principally for the purpose of combating the tall weed called "wild indigo," which occupies the low grounds. That tall weed, which is also fibrous, is the only vegetable that keeps pace in growth with jute; all other plants are distanced and smothered by the shade of the corchorus.

In the field planted broadcast no parasite can resist the vigorous and absorbing influence of jute. Even the hardy and noxious gramineal plant, commonly called "coco" in Louisiana, is destroyed after two seasons of broadcast cultivation. Another peculiar advantage of jute planting is the antagonistic influence it exerts over insects, especially the lepidoptera tribe, which generates the caterpillar. It having been stated in some reports of the Department of Agriculture that cotton fields surrounded by jute plantations were respected by the devouring worms, the Director of the Ramie-Planting Association made special experiments to test the reported fact. Three different fields, planted with various sorts of cotton, were belted by jute. None of them were visited by the caterpillar, while the cotton of adjacent plantations was partly destroyed by the insect. That protection is attributed to the above mentioned influence hostile to insects. It was observed that flies and butterflies kept away from jute fields, especially at the blossoming period. The peculiar odor of the flower, and the bitter exudation of the leaves, seem to be strongly repulsive to them, if not poisonous. So important a fact deserves to be demonstrated once more, on a larger scale. It would cost but little to plant belts of jute around the regular cotton plantations which have been heretofore invaded by these injurious insects.

The best period for cutting good crops of jute is during the stage that precedes the blossoming, or, at least, the seeding. The fiber is then fine, white, and strong The monthly sowing graduates the maturing of the successive crops, which facilitates labor. April planting can be harvested in July, May planting in August, and June planting in September. Any late growth can be harvested in October, and even after, if no frost interferes. The plant stands green until frost dries it up; but even then it can furnish a good material for paper. The cutting operation is done with a mowing and reaping apparatus. The mower, World number one, easily cuts jute of the largest size and thickest stands The albumen of the plant makes it easier to cut than dry wheat. The reaper gathering the stems, bundles are made and carried as fast as possible to the mill, where the textile is rapidly separated as described in our notice on ramie. Then comes the rotting operation. As fast as the fiber is turned out by the decorticating machine it is plunged into large vats filled with pure water, and left exposed to the heat of the atmosphere. Kept under at least one foot of water, the filament is disintegrated by the dissolution of the gums or resins which united it in a sort of ribbon. That process of fermentation, or rotting, takes about a week in Summer. With care and attention to the proper degree of rotting, the fiber comes out almost white, lustrous, and fine, like flax. The disintegration is known to be complete when the fiber assumes a pasty character. Then the rotted hanks are withdrawn, carefully washed in clear water, and hung up to dry in the shade. Care must be taken that the filament be well covered with water during the fermenting period, because atmospherical agencies tend to communicate to it a brownish color. After a few days of good weather it is ready to be shaken and twisted for baling, like other textiles. That new process of rotting the separated filament, instead of whole stalks, combines different profitable results—the advantages of economy in labor, in value, and in integrity of product. With this great progress in the manipulation, the India jute competition will surely be defeated if American agriculturists avail themselves of the chance offered exclusively to them at present.

The Hindoo planters cut their jute by hand, and subject it to the old system of ditch-rotting; they steep the plants in their draining canals and putrid water pools until fermentation is generated in the bark; then they strip and wash by hand the rotted filament on each stalk. All this is done with a great loss of time and of value in the product. The various sizes of the stalks put to rot cause great inequalities in the disintegration; tips are rotted before the butt-ends, and while the former are weakened by over-rotting, the latter remain yet undivided through an insufficient action of the ferment. Hence the inferiority of India jute as a filament, and the large amount of butts and other rejected parts which have to be deducted from the regular staple.

The jute-textile is naturally stronger than it is as it comes from India. The imperfect system of disintegration weakens and spoils it in the proportion of at least fifty per cent.

There is no such loss in the decortication by machinery; stripped from the green envelope, and reduced to a uniform ribbon, the fiber receives the direct and equal action of rotting ferments, without the injurious influence of excessive or of insufficient disintegration.

The Hindoo process of rotting the stalks is expensive, though it seems simple and easy. The work of manipulation is considerable, and is entirely wasted on eighty per cent of refuse. Besides all its anti-economical drawbacks, it has the great inconvenience of infusing into the fiber the tannic coloring of the bark. The brown tinge with which it is permeated depreciates considerably the staple; it prevents easy bleaching and mixture in white and colored goods.

Fortunately for the United States, all these difficulties are removed by the mechanical decortication applied from ramie to jute. The decorticating machine has operated publicly on the two plants and demonstrated the facts above stated.

Having tested the yield by the decortication of several acres, and verified in various manners the practicability of making this culture an abundant source of profit, the experimenters have purposely ceased cutting in order to save as much seed as possible for future development.

Samples of the fiber have been sent to different manufacturers, who have reported most favorably. Cordage made in New Orleans with the material has been considered superior to any made of the ordinary stock. The raw filament, produced directly by decortication, is already a marketable material. Extracted from young plants, that is to say, plants not yet in blossom, it makes an excellent strong stock for rope. When it becomes appreciated by use it may be classed as valuable as Sisal or Manila hemp. No doubt it will, sooner or later, be adopted in company with, if not in the place of, the imported fiber. It is a well-known fact that fiber obtained from its green stem is naturally strong and durable. That explains the qualities of the raw article, inasmuch as we, by our system, can rot it to the degree required for the purpose in view.

The long, soft staple made from it by water-rotting is remarkable in every sense. It has been pronounced equivalent to Italian hemp for many purposes, especially for packing yarns. As it can be thoroughly bleached and mixed with the other staples, it will soon exceed the value of the best India jute. Ropes made for home consumption of the two sorts—the raw and the retted—have been estimated at an average wholesale price of twenty cents per pound. Deducting six cents for waste and making, fourteen cents would remain for the fiber. That result would leave a considerable profit to the producer, the average cost of production not being over three cents a pound, where the cultivation is well managed. Let us add that the refuse, after the cleaning, furnishes fifty per cent of good material for paper making, the other fifty per cent furnishing a good manure.

It is the same case with ramie, the cultivation of which can be easily associated with that of jute. The two cultures will ultimately be the most profitable of the country—especially in Louisiana, where the decaying cultivation of sugar-cane demands a substitute.

The plants whose introduction is here advocated will become for sugar planters a timely relief, inasmuch as the large capital invested in their machinery can be utilized in ramie and jute production. Then but a small outlay for seed and the decorticating apparatus will be necessary.

There are two species of jute, as of ramie, the *dacca* and the *dessee*. The difference between them is notable. The first grows higher in stalks, but thinner in stands. It is the reverse with the second, which, however, grows and matures faster. The yield and quality of fiber in each are nearly the same. They are distinguished by the seed. One is inclosed in a pod, the other in a bean. The seed of the dacca variety is brown; that of the dessee green. We have cultivated both varieties, and we think that the last named could furnish two crops a year, on account of its rapid growth. The dessee crop can be made within two months after sowing.

Besides the "Ramie-Planting Association of New Orleans," several Louisiana planters have experimented on the jute. M. de Lobel-Mahy, of Saint James Parish, a gentleman of intellectual culture, has planted some for seed, and he expresses his opinion as follows:

"I am convinced that the jute cultivation can perfectly succeed in Louisiana. Most probably that plant will produce better results than the sugar-cane cultivation, which is rendered more and more difficult by high wages," etc.

Dr. B. Laplace, a planter of ability in Saint John Baptist Parish, has also tried the jute. "There is not a more profitable cultivation," he says, "if only six cents can be obtained for the water rotted product."

M. Revilion, of Lac Arthur, Calcasieu Parish, reports a remarkable growth, and the successful destruction of coco by jute; of which he speaks, like Dr. Laplace, with enthusiastic confidence.

Mr. F. Sanfroid, merchant of New Orleans, has obtained such a prolific growth of jute in a garden that he thinks it destined to restore the prosperity of our agricultural industry, if extensively cultivated.

Dr. Landry, of New Orleans, has observed the influence of jute-growth on insects, and writes as follows: "I have seen, on the first of October, a cotton field in full foliage, flowers, and bolls, without a single insect-bite. That cotton field was surrounded by a jute growth. All the other cotton fields, far and around, were more or less devastated by worms. If this fact does not conclusively prove the protective influence of jute over cotton, it at least contains a great presumption in favor of the affirmative, as the emanations from the jute flower are injurious to the insects. Paris green has succeeded generally in saving the cotton, wherever it was properly applied; but the jute would cost less and be more reliable, on account of the uncertainty of negro labor in disseminating the green poison over the cotton leaves."

Besides these, and many other opinions expressed in favor of jute planting, besides, also, the repeated recommendations of the Hon. Frederick Watts, many merchants, manufacturers, and gentlemen of standing and intelligence in the North, warmly advocate jute production in the United States. The Hon. E. H. Derby, of Boston, has for years past earnestly fostered the idea of its introduction. He has studied the question, and, by publications, has disseminated a knowledge of the subject with perseverance and talent.

Having visited jute manufactories in Dundee, that gentleman has described in some official reports the working of the article, and shown how easy it would be for Americans to establish such factories in the Union.

Thomas H. Dunham, Esq., another Boston gentleman of high, patriotic sentiments, has also, for a long period, recommended the same object, and has spoken with competency on the matter. "Our government," he writes, "should do all in its power to encourage the growth of jute in the country. How immense would be the trade. Manila paper is nine tenths jute; gunnybags, oilcloth, burlaps, gunnycloth—what vast use we make of each and all. Sacking for wheat in the California market alone is an immense trade for jute. What is wanted in the United States is a special worker to go into the carrying out of its growth, taking such practical steps as will insure its universal growth where it is possible in this country, making the matter a special bounty to encourage and stimulate the growth of jute. No one man can prepare the work unless he has that and nothing else to attend to. A pamphlet may give facts, but it brings so much care; one has to give time, patience, care far beyond his means. I hail with great satisfaction the specimens of American jute sent to me; they are worthy of all praise and encouragement. The country is indebted to the producer, and I would have his labor remunerated. I will do all I can to further the labor in this culture. The policy of the British government is to hold the jute trade; our policy is to bring every facility to its growth and culture here. The great use of jute in all branches will give it a constant demand fully equal to one half of our cotton crop. It is good for a variety of purposes."

The above opinions express the sentiments of all competent economists and enlightened citizens desirous of promoting the national welfare. Every one familiar with this important question, thinks the Government should take immediate steps to popularize the cultivation of jute throughout the Union.

First—A knowledge of the culture and production should be diffused by means of a short treatise distributed free.

Second—Premiums of sufficient amount to attract capital should be offered for the largest and best cultivation.

Third—A model jute plantation should be established and managed by the government, under the superintendence of the Department of Agriculture, to start the great work, to impart the initial teaching, and, at the same time, to produce seed for the people. We have now in the country all the necessary elements for a successful and rapid development of jute cultivation; lands adapted to the purpose; climate congenial; seed domesticated; practical knowledge of the culture, and all the mechanical requisites for a valuable production. But little effort and outlay on the part of the Government would be necessary to develop jute and ramie culture so as to suppress foreign monopolies and save millions of dollars to the country, and to establish new industries which would give employment to millions of laborers. In every sense, the matter is worthy of the patriotic attention of our National Congress.

NEW ORLEANS (La.), December, 1873.

PRUNING DECIDUOUS FLOWERING SHRUBS.

FOREST PLANTING, A SOURCE OF WEALTH.

BOTANICAL AND ZOOLOGICAL FARMS.

THE HARD AND ORNAMENTAL WOODS OF THE PACIFIC COAST.

VENETIAN SUMACH.

PEACH FUNGUS.

TAKING UP AND CUTTING BACK FRUIT TREES AT PLANTING TIME.

OUR CALIFORNIA FERNS.

PRUNING DECIDUOUS FLOWERING SHRUBS.

BY E. L. REIMER.

From time to time we are assailed with grievous complaints from per
sons possessing residences and private gardens, that deciduous shrub
will not flower, and they are now very generally looked upon as s
much rubbish by those of our community who are in the habit of pur
chasing ornamental trees, shrubs, and plants.

If a nurseryman offers for sale to his customers such shrubs as lilacs
snowballs, philadelphus, deutzias, etc., they will tell him that they ar
of no earthly use, as they will never produce any flowers in this coun
try; and nothing will induce them to purchase one of these shrubs un
less they see it in bloom in the nursery, and even then, in a year or s
after, they will return, grumbling to the seller that they have bee
deceived, because they have not again seen it in bloom.

Years since I used to sell a quantity of deciduous flowering shrub
but the sale of them has gradually diminished from year to year, and
believe that every nurseryman will say the same.

I must here remark that this family of very interesting plants o
shrubs will bloom in this country just as profusely as in any other. I
is not the fault of the climate that our friends are disappointed, but
the jobbing gardeners who pretend to attend to private places. I wi
not say that all are equally ignorant and pretentious; on the contrary
we have some really well experienced and reliable men amongst them
but the great majority know but very little about gardening, and pr
viously to their intruding themselves on the public in this part of th
world as horticultural experts, have occupied no higher grade in th
profession than experience in the use of the broom, the manure for
and the wheelbarrow would entitle them to. Indeed, to this work woul
they be rigidly restricted in the East and in Europe, if we except th
in very busy times they might be permitted to dig a few potatoes, etc.

Some time since I made it an especial point to make tours of observ
tion around the city and suburbs, for the purpose of ascertaining f
myself the cause of the before mentioned complaints. To my gre
astonishment, I found that in every garden wherever there were lilac
snowballs, and similar deciduous shrubs, they had all been trimme
down to a uniform shape, and that, too, in the months of January an
February. Here, then, was the reason why the lilacs and snowballs d
not bloom, and a most substantial one, too.

One of these men gets a job to clean up and bring the garden into good trim. He sets to work, hacking away at every tree and shrub which he sees in the place, little thinking and never caring that he is doing a vast deal more damage than good; his aim is to reduce every tree, plant, and shrub to his idea of beauty of form. He shows no mercy to the lilac bush, profusely loaded on the ends of its last year's shoots with its purple buds of promise, each pregnant with a glorious thyrsus of flowers, and which, if only let alone for a few more months, would have presented a magnificent appearance, with its profusion of bloom, and have equally delighted with its exquisite fragrance. Alas! this tree, with others of like character, which would have been the pride for a time of the neatly kept garden, until other beauties could follow, is rudely trimmed into sugar-loaf form, and when May arrives is freshly clothed in new green foliage; but the lady of the house looks in vain for the flowers, although her gardener has confidently assured her that her shrubs would certainly bear flowers in the Spring; he really not knowing that he had mercilessly shorn the shrubs of all their flowering buds, and cast them on the rubbish heap, and that renewal was entirely out of the question until the next season. Thus, the proprietor becomes disgusted with the shrubbery, and it is cast out of the premises, discarded as worse than useless.

However, this state of affairs is rapidly passing away. We have some very good jobbing gardeners around San Francisco, and any one needing the services of one, can hear of such of any of our reliable nurserymen, who certainly will not recommend one of the incompetents, although I will admit that there are very many of them about the city who are unfit even to do farm work.

Snowballs, lilacs, spireas, etc., should neither be pruned in the Spring nor in the Winter season. They make their new wood in June, and after that growth they set their flower buds on the ends of nearly every young shoot. In the Fall they shed their foliage, and the buds then commence gradually to swell in our mild climate; they remain longer dormant in a country where there is snow and frost. An experienced eye will always discern the difference between a leaf and a flower bud. Whatever trimming is needed should be done immediately after the flowering, and they should only be thinned out during the Winter months. If this rule is followed out, the reward to the cultivator will be a rich crop of beautiful flowers.

FOREST PLANTING, A SOURCE OF WEALTH.

BY PROFESSOR EZRA S. CARR.

I desire to call public attention, and particularly that of owners of large bodies of land in California, to the importance of forest planting, as a source of future wealth. The value which the crowned heads of Europe have put upon their forests is well known; the stringent, and, as it might seem, almost inhuman laws made for their protection, are the result of a wise and far reaching policy, far more creditable than our national indifference. In this, as in so many other things, with us, the necessary legislation will follow enlightened public opinion, itself the effect of individual examples and successes.

The first laws made in England for the preservation of forests (not to be confounded with laws for the preservation of game), were made by Queen Elizabeth, in consequence of orders given to the commanders of the Spanish Armada, viz: in the event of conquest, to destroy the English forests, and especially that of Dean.

Now Dean was, like Windsor and Sherwood, an appanage of the crown, filled with noble oaks of such excellent quality for ship building that its destruction was equivalent to cutting off the right arm of the nation. Luckily for England, and for us, the Spanish axes did not accomplish the mischief they intended; the great oaks grew on unharmed until the time of Charles I, who reduced their numbers from one hundred and five thousand five hundred and thirty-seven to some thirty thousand—one of the crimes against the English people for which a sad reckoning day was to come. One of the first movements of the Restoration was the replanting of eleven thousand acres; and the forest of Dean, sixty-four square miles in extent, is now fully recovered.

Windsor Forest, once one hundred and twenty miles in circuit, has dwindled to about fifty-six, of which the Little Park, immediately connected with the castle, containing five hundred acres, and the Great Park, containing four thousand, are the most important. It is well stocked with game, and contains choice plantations of exotic trees and shrubs.

The glory of Sherwood, once so famous in the legendary history of England, has departed, but it still contains one thousand five hundred acres of very old oak timber, and within its ancient limits are found many interesting trees. The New Forest in Hampshire, originally ninety miles in circumference, also contains timber of great value.

The history of arboriculture in England, both in the royal forests and the seats of the nobility, is of great practical interest to us, because the kind of trees there found of most value for timber, fuel, and the various purposes of the arts, will all flourish in a large part of the United States, and some of the best of them are indigenous here. In the case of the royal forests, the records have been carefully kept for a long period, while the local traditions of some historic trees extend back to a remoter time than that of Robin Hood, or Herne, the Hunter. They are under the general control of the Crown Commissioner of Woods and Forests, and employ a small army of officials of graded rank—Lord Wardens, Deputy Wardens, Verderers, Woodwards, etc., who, it is said, deplete the royal revenue, and contract the ancient limits. It is comforting to know that they are subject to some of the evils incident to public domains elsewhere; that squatters thrive where poachers perish without anybody being to blame. But notwithstanding these drawbacks, the royal forests contribute no inconsiderable part in the revenues of the crown.

The grandest tree of these forests is the oak, the tree which, living or dead, contributes so much to the beauty of the Englishman's home, and which may be said to have given him the supremacy of the sea. It is believed that an oak, after reaching a circumference of four feet, gains a solid foot every year, and it is on this basis that the profits of the plantations, as timber, are estimated. But the thinnings are also very valuable for poles, posts, hurdles, etc. Evelyn estimated the total profits of one thousand acres of well matured oak timber at six hundred and seventy thousand pounds sterling. The relative value of the oak has changed somewhat by the introduction of foreign trees of a more rapid growth. Immense plantations of the Norway pine, Scotch fir and larch, have superseded them in the north of England and Scotland.

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To the tree which only Americans despise, Lombardy poplar, there is not one which we shall not require in California within fifty years, because each is as admirably fitted to some special want of the artist or manufacturer, as the lime is for the most delicate carving, or the willow for gunpowder.

The indigenous trees of the Pacific Coast are the most highly prized, and among the most profitable in European plantations. The nurseries of France, Germany, and Italy are well stocked with our giant Sequoias, our Firs and Pines. Noble avenues of American Plane, and the Liriodendron or Tulip-tree of the Middle States, adorn the cities of Central and Southern Europe. A few poor specimens of these trees may be seen in private collections in California, but the nurserymen do not propagate them. As yet, there is little demand for anything but quick-growing, showy trees—Monterey Cypress, Blue Gum, and Acacia. All our forest planting seems tending towards *Eucalyptus culture* on a large scale. This seems the greater pity, because so large a part of the arboreal world is at our command from which to choose. The Cinchona, of South America, would doubtless flourish in some localities in our State; and China and Japan have many useful trees which could be easily acclimated here.

It is only by observing and respecting the methods of Nature that men succeed in gaining mastery over her hidden resources. Now, Nature never plants a field or forest with a single species; she loves an infinite diversity. A plantation of Blue Gum would be an abomination in her sight, and, we may be sure, she has some chosen parasite in reserve with which to destroy it. In Scotland, because Larches were most immediately profitable, they planted more and more Larches, until a fungus came which devoured first their hearts, and then all their ligneous fibers, until nothing was left of them but bark and roots.

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Diversified planting, like diversified farming, will prove the only profitable mode for California in the end. A thousand acres planted with a variety of evergreen and deciduous trees, with due regard to their habits and economic uses, we believe, would be one of the safest and most permanently profitable investments that could be made upon the land. Nor need we wait even a quarter of a century for returns.

The Eucalypti, intrinsically valuable in so many respects, make admirable nurses for slower growing and more tender species, and may be used as soon as this object is accomplished. The rate of their growth and importance in our forestry, and of some other exotic trees, will be treated in a subsequent paper.

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One of these men gets a job to clean up and bring the garden into good trim. He sets to work, hacking away at every tree and shrub which he sees in the place, little thinking and never caring that he is doing a vast deal more damage than good; his aim is to reduce every tree, plant, and shrub to his idea of beauty of form. He shows no mercy to the lilac bush, profusely loaded on the ends of its last year's shoots with its purple buds of promise, each pregnant with a glorious thyrsus of flowers, and which, if only let alone for a few more months, would have presented a magnificent appearance, with its profusion of bloom, and have equally delighted with its exquisite fragrance. Alas! this tree, with others of like character, which would have been the pride for a time of the neatly kept garden, until other beauties could follow, is rudely trimmed into sugar-loaf form, and when May arrives is freshly clothed in new green foliage; but the lady of the house looks in vain for the flowers, although her gardener has confidently assured her that her shrubs would certainly bear flowers in the Spring; he really not knowing that he had mercilessly shorn the shrubs of all their flowering buds, and cast them on the rubbish heap, and that renewal was entirely out of the question until the next season. Thus, the proprietor becomes disgusted with the shrubbery, and it is cast out of the premises, discarded as worse than useless.

However, this state of affairs is rapidly passing away. We have some very good jobbing gardeners around San Francisco, and any one needing the services of one, can hear of such of any of our reliable nurserymen, who certainly will not recommend one of the incompetents, although I will admit that there are very many of them about the city who are unfit even to do farm work.

Snowballs, lilacs, spireas, etc., should neither be pruned in the Spring nor in the Winter season. They make their new wood in June, and after that growth they set their flower buds on the ends of nearly every young shoot. In the Fall they shed their foliage, and the buds then commence gradually to swell in our mild climate; they remain longer dormant in a country where there is snow and frost. An experienced eye will always discern the difference between a leaf and a flower bud. Whatever trimming is needed should be done immediately after the flowering, and they should only be thinned out during the Winter months. If this rule is followed out, the reward to the cultivator will be a rich crop of beautiful flowers.

FOREST PLANTING, A SOURCE OF WEALTH.

BY PROFESSOR EZRA S. CARR.

I desire to call public attention, and particularly that of owners of large bodies of land in California, to the importance of forest planting, as a source of future wealth. The value which the crowned heads of Europe have put upon their forests is well known; the stringent, and, as it might seem, almost inhuman laws made for their protection, are the result of a wise and far reaching policy, far more creditable than our national indifference. In this, as in so many other things, with us, the necessary legislation will follow enlightened public opinion, itself the effect of individual examples and successes.

The first laws made in England for the preservation of forests (not to be confounded with laws for the preservation of game), were made by Queen Elizabeth, in consequence of orders given to the commanders of the Spanish Armada, viz: in the event of conquest, to destroy the English forests, and especially that of Dean.

Now Dean was, like Windsor and Sherwood, an appanage of the crown, filled with noble oaks of such excellent quality for ship building that its destruction was equivalent to cutting off the right arm of the nation. Luckily for England, and for us, the Spanish axes did not accomplish the mischief they intended; the great oaks grew on unharmed until the time of Charles I, who reduced their numbers from one hundred and five thousand five hundred and thirty-seven to some thirty thousand—one of the crimes against the English people for which a sad reckoning day was to come. One of the first movements of the Restoration was the replanting of eleven thousand acres; and the forest of Dean, sixty-four square miles in extent, is now fully recovered.

Windsor Forest, once one hundred and twenty miles in circuit, has dwindled to about fifty-six, of which the Little Park, immediately connected with the castle, containing five hundred acres, and the Great Park, containing four thousand, are the most important. It is well stocked with game, and contains choice plantations of exotic trees and shrubs.

The glory of Sherwood, once so famous in the legendary history of England, has departed, but it still contains one thousand five hundred acres of very old oak timber, and within its ancient limits are found many interesting trees. The New Forest in Hampshire, originally ninety miles in circumference, also contains timber of great value.

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"The committee on this subject report that during the year no facilities have offered which could be used to promote the cultivation of the cinchona tree in California. The committee, however, report progress and ask for further time. The project is entertained that this well approved subject may be availed of to obtain through legislative action the appropriation of lands, not only to try the cultivation of the cinchona tree, but for the experimental culture of any other desirable plant; or, in other words, the foundation of a State Botanical and Zoölogical Farm. Such an appropriation would render a permanent service and honor to the State, while the care and expense devoted to the one single object might be lost by the failure of the experiment. For such an appropriation a magnificent botanical garden might be created. Associated with a State sanitary institution and thermal resort for chronic diseases, it would form a new and superb institution. Forming, as it would, the permanent residence of several competent physicians, botanists, and naturalists, this would secure for it efficient superintendence, while oftentimes the voluntary labor of many grateful convalescents, or other persons infirm from various causes, would diminish the expenses. In this prospect, your committee respectfully asks to be continued.

"ARTHUR B. STOUT,
"THOMAS M. LOGAN."

The committee was continued accordingly.

Should the bill introduced February twenty-third, eighteen hundred and seventy-two, before Congress, by Senator Morrill, of Vermont, for the support of agricultural colleges, be adopted—"The support of agricultural colleges. Washington, February twenty-third. A bill introduced by Senator Morrill, of Vermont, to-day was referred to the Committee on Education and Labor, appropriating to each State in which agricultural colleges have been established, in accordance with the law of eighteen hundred and sixty-two, one million acres of public lands for their further endowment and support. No mineral lands are to be taken under this Act"—then would the cession of land be sufficient to establish four agricultural colleges in as many different regions of the State, so that their benefits would be fairly distributed.

The establishment of these collegiate farms, with botanical gardens for experimental horticulture and sanitary objects, would necessarily become points of attraction for farming settlers in their vicinity, and thus every such endowment would become an important center of progressive civilization and wealth in the State.

As the bill of Senator Morrill proposes the cession of one million acres, abundant funds will accrue for the support and development of the collegiate farms; for if ten thousand acres were allotted to each farm, in all forty thousand acres, the remainder sold or leased would become yearly an increasing value.

The advantages in a sanitary point of view, in promoting public health by the suppression of contagious diseases and preventing hereditary transmission, are manifest. This sanitary question is now one of legislative solicitude. The addition of a public sanitarium for chronic diseases, with the use of thermal springs and public baths, would in no wise interfere with the agricultural and educational objects in contemplation. Their presence, on the contrary, would give an additional value and interest, and invite a larger influx of interested parties to the district. Ample space for all these objects exists in these large tracts to permit the various departments to be isolated. The following quotation from page forty-nine, article, "Social Evil," in the first biennial report of the State Board of Health, eighteen hundred and seventy and eighteen hundred and seventy-one, explains the merits of the subject:

"The great diminution in the amount as well as the virulence of venereal maladies in the present, as compared with the ancient times, and the power exercised over the disease, as well on its primitive forms as on its hereditary transmission, by medical treatment, evidently allows the inference that still greater mitigation of the evil may be effected.

"The squalid poverty and filth of former ages no longer exist in our favored country. In a comparative view, the poor of our country are all rich. But yet, reformative legislation may very much accelerate the progress of improvement. To this end, the establishment of hygienic institutions to which the afflicted may easily resort, without the necessity of a record or register of their affliction, will render benefit. The disgrace and secrecy which accompany contamination contribute immensely to prolong and intensify the evil, and very few are willing to make a public record of a mortifying fact. Let, then, the cure be made as private for the indigent as the rich. In large towns hospitals and dispensaries should be opened, of easy access to all parts of the place, and in counties, a county physician, with an ample salary, should visit through the county, whose services would be free to the poor. The magnificent public baths of ancient Rome are an institution which would do honor to our philanthropic age.

"It was, perhaps, this very matter that led the statesmen of that epoch to call them into existence. The religious orders of those times were clever enough to convert to their uses the thermal springs of their respective countries, and by investing them with the idea of divine visitations, won the merit and the profits of divine cures."

If, then, the Legislature would appropriate some thermal springs of acknowledged efficiency, and devote them to public use, with free accommodations for the indigent, and as a State hospital to which the poor sick of the State might resort at a very low cost, or for nothing, and even, in extreme cases, give free transport to the locality, more absolute relief and benefit would be done to the State than by direct legislation against the "social evil."

At present such resorts are occupied as private property, and are only accessible to those who have ample means to pay for their enjoyment. Therefore,

The People of the State of California, represented in Senate and Assembly, do enact as follows:

SECTION 1. Public lands, in area —— acres (taken from the lands of the State of California, or obtained from the public lands of the United States in California, by the petition of the State to the United States for the said appropriation), shall be set apart, applied, and surveyed for the aforesaid objects of public utility and philanthropy.

SEC. 2. Said lands shall not be necessarily limited to one continuous tract; but to obtain the benefit of the different zones of climate and the different soils, altitudes, and thermal waters of the State, they may be located in four different nearly equally divided sections, and four differently selected districts.

SEC. 3. Five Trustees, to consist: first, of the Governor; second, a member of the State Medical Society, to be appointed by the Governor;

third, the State Geologist; fourth, the Secretary of the State Board of Health; and fifth, the Superintendent of Public Instruction, shall carry out the object of this Act, take charge of the lands appropriated, appoint managers and superintendents, and lease to such farming families as will agree to promote the general plan.

SEC. 4. Said five Trustees shall hold their commissions for four years, and their acts shall be subject to legislative confirmation.

EXTRACT FROM THE TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF CALIFORNIA, IN OCTOBER, EIGHTEEN HUNDRED AND SEVENTY-TWO.

Report of Committee on Cultivation of the Cinchona tree, and the appropriation of Public Lands for Botanical Farms, Zoölogical Collections, and the use of Thermal and other Mineral Springs in Chronic Diseases.

The interest the committee takes in the subject committed to its care, is unabated. This important and interesting question now depends upon the action of Congress upon the bill introduced by Senater Morrill, of Vermont, proposing to donate large tracts of lands for these purposes in every State. We have, therefore, to endure the delays dependent upon this action, which it is proposed to urge with new vigor when Congress shall again convene.

A. B. STOUT, M. D.,
THOMAS M. LOGAN, M. D.

The preamble of this bill, introduced by Mr. Comte, gives an ample explanation, and shows the phases through which the general idea has passed, and is in full way, we hope, to obtain ultimate success.

The bill of Senator Morrill, of Vermont—a bill whose scope is so truly national and philanthropic—has already passed the Senate, and only awaits the confirmation of the House of Representatives.

The plan of the bill, if we mistake not, is to sell one million acres of United States lands at the Government price, and supply, from the accruing funds in the United States Treasury, the sums necessary to inaugurate the agricultural colleges. The interest on the balance to be divided pro rata among the States for the further support of the colleges.

Now is the moment for the friends of agricultural science and natural history to extend their influence and persuasion to obtain the final passage of this admirable bill. The name of Morrill will be gratefully associated in the mind of every landholder in the nation. Education in agriculture has now become as indispensable to the farmer as it is in all other departments of industry. Hereditary experience and oral instruction no longer suffice, important as they may be to success in farming. The evening discussions around the big stove in the country inns are the principal lectures heard on husbandry, and the town hotels are our agricultural colleges; that is, when the politicians give the farmers a chance to talk—and then the fermented product of the grain crop is the chief inducement to the exchange of opinions.

The question will naturally arise, should all this fine endowment be granted to one agricultural college—the present existing institution? The great extent and the variety of soils, climate, and altitudes in California, render this State exceedingly favorable for the introduction and cultivation of all the great commercial products; and this circumstance favors the division of the land into at least four great farms, each with its college, Board of Trustees, and general organization. The more cultivated minds can be induced to devote their energy to the work, the more will the students and practical young farmers flock to their schools and fields, and a generous rivalry will stimulate them all.

How grand the picture on the mind of all these model farms, in their various details and departments, in full operation; and when each graduate may write "What I know about Farming," with honor to himself and benefit to his State.

THE HARD AND ORNAMENTAL WOODS

OF THE PACIFIC COAST.

BY C. A. STIVERS, M. D.

Living in a new country, as we are, and surrounded to a certain extent by new conditions of life, it is our duty to foster and develop all that shall make us prosperous and wealthy. Not alone are we to unfold the hidden treasures of our own State, but also those of adjoining States and countries.

It can be truly said, that to us belongs the general prosperity of the entire Pacific Coast, and, if we wish to erect an empire of commercial greatness for ourselves, and for those who are to follow us, it must be done by reaching out on all sides and drawing to us the materials of wealth, which are at present lying unnoticed and unutilized.

California stands in the current way of, we may almost say, the world's commerce, and it is only necessary to so direct the streams as that they shall flow through her, receiving, as they must, an increased impetus from her aid and knowledge.

With these facts before me, and also with a view of bringing into notice a branch of commerce which is but developing itself on this coast—that in hard and ornamental woods—I have thought a few remarks would not be out of place. In using the title of "Hard and Ornamental Woods of the Pacific Coast," I have done so for the purpose of including all woods of that description found growing adjacent to the coast, and reaching from Behring's Strait on the north to the Bay of Panama on the south. Commencing at the southern point of this timber belt, and passing north through Central America and Mexico, we meet with a large number of valuable woods already known to commerce; while there is every reason to believe that there are many others, equally valuable, which have as yet been unutilized.

The most common hard woods received from this southern part of the timber belt are those known to commerce under the general name of "Spanish Cedar" (natural order, *Cedrelaceæ*). While all these belong to the same general class, they are still divided into many varieties, marked by differences in color, texture, and grain. Those growing in Nicaragua (small lots of which have, at various times, been imported), like the cedars in general of Central America, are finer in texture and more beautiful than those in Mexico—a variety from Tiger Island (a small island in the Gulf of Fonseca) being as hard and fine as the best mahogany. Unfortunately, this island has been almost stripped of these valuable trees.

Central America also furnishes an exceedingly hard wood called "*Amapa prieta*" (local name), which resembles the black walnut in some degree, but is of much greater density, and somewhat lighter in color. Small lots have been imported and used in cabinet work, for which it is well fitted on account of its great hardness.

Nicaragua more especially grows the "*Carretta*" (another local name), which seems to be but a variety of the preceding, and has often been mistaken for walnut. Its principal use has been in small carvings and for ship purposes, small quantities having at times been imported for use at the Navy Yard.

Another valuable wood also comes to this port, chiefly from Nicaragua, called "Fustic" (*Morus tinctoria*). At present, its principal use is that of a dye-wood, producing a clear, fine yellow stain. The wood is of a light and exceedingly handsome yellow color, close grained, and capable of receiving a high polish.

As we advance north into Mexico, the cedars are more plentiful, but are somewhat softer than those found growing further south; this quality is, however, a gain rather than otherwise, as the soft cedars of the west coast of Mexico are highly esteemed in the Eastern States; prices having advanced to such a rate as to allow of a number of shipments being made from this port to New York by steamer, at a fair margin of profit. Their principal use is for cigar boxes, stair and cabinet work. Mexico has also the pencil cedar growing on the west coast, but the exact locality is at present unknown to me.

Besides the cedars, Mexico furnishes a great variety of other hard and ornamental woods, small shipments of which have, from time to time, been received at this port.

The "*Haba*," a dense, hard wood, is spoken very highly of by ship-carpenters, as being well adapted for their work.

The "*Primavera*," or white mahogany, is an exceedingly fine cabinet wood, hard and dense, of great durability, and susceptible of a fine polish. It is also well fitted for ship-work. Of rosewoods there are two varieties, the red and black. The red rosewood is a kind of bastard wood, somewhat like the true rosewood, but lighter in color and much softer in texture, while the black is in all respects equal to the rosewood of South America.

"*Linole*" (natural order, *Aurantiaceæ*,) (?) is rather a soft wood, but with a very pretty and curious figure. Its principal value is in its perfume, resembling somewhat that of bergamot. It is used in the manufacture of fancy boxes and caskets.

"Lignumvitæ" (*Guaiacum officinale*) is also found growing in large quantities in Mexico, and is in all respects a valuable and desirable wood. Its hardness and durability are well known. It is used in ship-building where a very hard wood is required, as in the case of block and pulley wheels. It is also employed in medicine, in the form of tincture, infusion, etc.

In addition to the woods already mentioned there are oaks of various kinds and qualities to be found along this Pacific timber belt; the *Quercus skinnerii* being one of the most valuable. At present the country is so undeveloped and in such a condition that there are no great facilities for getting these woods to points of shipment. But if their value is only demonstrated there will soon be such a demand as to induce an active interest to be taken in this branch of commerce, by both the people and the Government.

I shall, at a future time, continue this article by enumerating and describing the hard and ornamental woods of the northern portion of this timber belt, reaching from Mexico through California, Oregon, Washington Territory, British Columbia, and Alaska.

Before passing to the consideration of the more northern part of the west coast timber belt, I wish to call attention to a number of other hard woods found growing in Mexico, and which were not mentioned in my previous article. At present, they are but little known (only specimen lots as yet having been received here), and, therefore, my descriptions will, necessarily, be brief.

Cacaguananchi (palm)—This tree is called by some the "Chocolate Palm," on account of the rich deep chocolate color of its wood. It is straight grained, hard, dense, and from appearances well adapted for small turnings and cabinet work.

Moro (mulberry)—Wood somewhat like the cedars in grain, but of a much darker color; hard, close, and capable of a fine finish, in which state it resembles walnut. Cabinet work and turnings.

Caoba (mahogany)—Wood light colored, grain plain; useful for small trimmings and cabinet work.

Guayacan (palm)—Light, almost a white wood; close grained, dense and hard. It would make good panel work.

Zorillo (foxwood)—Wood of a light color, fine texture; well suited for panel work.

Arrellano—A light cherry-colored wood, and having somewhat the texture and grain of the true cherry wood. Cabinet work, etc.

Palo prieto—Wood light brown, in some respects similar to the *amapa prieta* in hardness and texture.

Palo muelo—Light cherry-colored wood, striped with a yellowish tinge, which gives it a very handsome appearance. Hard and close grained, being susceptible of a fine polish. Cabinet and panel work.

Palo fierro (ironwood)—A very dense, heavy wood, as its name implies. It is extremely durable, resembling in many respects lignum-vitæ; color dark, almost black; useful for ship work, and also where a very hard wood is required; as, in blocks, wheels, pullies, etc.

Arrallan—A light-brown wood, somewhat like ash, but lighter in color. Good for wagon work, and for other purposes, where a strong tough wood is required.

Laurelillo (bay tree)—Wood like walnut in color and texture. It has also the same finish, and can be used in all cases where the latter named wood is needed.

Tascate (pencil cedar)—A soft wood, used mainly as pencil casings, for which it is invaluable.

Cabo de Hacha (handlewood)—Evidently, from appearance, a species of hickory; strong fine wood, makes good axe-handles, and I should judge, also valuable as a wagon material.

Tepezapote.—Wood dark cherry color, resembling very much in character cherry wood.

Espina del Mar.—Wood of a reddish chocolate color; compact in texture, and takes a fine finish. Cabinet work.

Tapinseran listarde and *negro.*—Dark, ebony-like in color, resembling the true ebony also in grain and texture, but not in density, being much lighter. Rather dark for cabinet woods, but well adapted for trimmings, frame work, etc.

Amapa blanca.—Light, almost a white wood, somewhat resembling hickory.

Guilochi.—Hickory-like wood, apparently of small growth.

Cuate.—Like the preceding, but darker in color.

The last three are much of the same character, and adapted to the same uses.

VENETIAN SUMACH—(RHUS COTINUS)

BY DR. A. KELLOGG.

This very ornamental shrub, so far as we know, is considered an exotic, indigenous to Siberia, Austria, Lombardy, etc. The writer, in early days of the organization of the California Academy of Sciences, presented a specimen (in fruit only) to the old herbarium, obtained from Bexar Pass, Texas, found native on the arid mountains of that section. This is probably the same as the *smoke tree* of our gardeners and ornamental nurserymen. It is, however, to its commercial importance that we desire to invite a moment's attention. Professor Carr, and many others who desire to render practical service to our agricultural and industrial interests, continue to urge a more varied and independent culture. These hints are being executed, relative to new industries, with unparalleled vigor by our enterprising agriculturists.

The modern Athenians use this wood (Fustic) for dyeing wool a most beautiful rich yellow, and the whole plant is used in Italy for tanning sheep and goat skins into morocco. We import annually about sixty thousand to seventy-five thousand bales of one hundred and eighty pounds each. The price here by the ton has been from seventy-five dollars to one hundred and twenty-five dollars per ton—at retail much higher. No adequate substitute has ever been found for the life-giving vigor, soft, velvety, and elastic properties it communicates to the skins, even in very small relative proportions to other stronger and more drying tans. On a coast with Italian and Sicilian skies—a climate often too arid at the south coast for surety in other crops—certain dry season to secure harvests in prime condition—hides of almost illimitable supply at our doors—limestone, and red clay, and sandstone soils—modern inventions for labor-saving uses, and hot, sunny, rocky hillsides, or bottom lands, asking the careful hand of culture—the pioneer in this enterprise will prove a benefactor to the State and nation, and reap a rich reward. A word of detail only, and we dismiss a subject full of the deepest interest to the people of this coast. In the Agricultural Report for 1854, p. 34, *Rhus coriaria* is quoted as the name; if so (and we have no access at this writing to verify), it is a mistake. The species probably intended is *R. coreacea*, which is synonymous with ours. But if *R. coriaria* is really the plant the writer refers to, it may be another of similar value. Indeed, many other species, also those commonly native to the United States, are thought to be of equal value; but we deem it prudent to recommend only the world-wide and best renowned article.

Seeds may, doubtless, be had at the Agricultural Department, at Washington, or from Sicily, Aleppo, or anywhere in the south of Europe. Also propagated by cuttings from roots, stems, or by layers, etc.

Seeds are best, started in beds, at any time, with due attention. The most proper season for transplanting is November, December, and

January. Of course, the best time is the first of the rainy season. Plant two to four feet apart in the rows, and rows four to six feet apart, for space best suited to plow and harrow, or horse hoe—say, two or three cleanings. In Sicily, the rainy season closes in May, like ours, when the crop is laid by, previously hoed, as stated. The crop is gathered in July and August, cut four to six inches from the ground, and laid in handfuls—not spread out for a day or so to dry—not allowed to bleach. The leaves of young sprouts, that spring up vigorously every year, are the only parts used, as they are free from dead or decaying leaves of the older trees. Care on this point, and a dry climate, like ours, where no casualty of rain ruins an occasional crop, has given Sicily a staple reputation in the markets of the world. There are, nevertheless, those who adulterate the article, and out-ape the ape. The whole twigs, leaves and all, are also cut up, and used for tanning. To a home market this might, perhaps, be the most feasible.

Since its cultivation in Maryland and Virginia the price of the foreign has fallen, as it proves inferior, except for its lighter and clear hue—the American being a little greenish yellow. Yet, the latter has risen twenty to forty per cent, while the Sicily has correspondingly fallen.

MANAGEMENT OF THE SURFACE SOIL.

BY ROBERT WILSON.

A narrow strip of ground along either side of the fence erected on my own premises last Spring, having been trodden down and the surface thoroughly impacted by the feet of the workmen engaged in putting up the inclosure, was found to be quite damp when dug into along in the Summer, while the ground by the side of it, which, like this strip, had been deeply spaded up during the preceding Winter, was perfectly dry as far down as it had been disturbed. I was engaged in tree culture in Santa Cruz, and had there a very different experience, having found that the more loose and open the surface soil was kept, the greater its capacity for absorbing and retaining moisture. The explanation of these different results is found in the fact that the atmosphere in the vicinity of Santa Cruz, owing to proximity to the ocean, retains, even in the Summer, a large share of humidity, which the porous condition of the ground enables it to readily absorb, keeping it thereby in a constant state of moisture; whereas, ground near Vallejo, being too far inland to be much affected by the sea air, is in better condition to retain the moisture with the surface somewhat impacted. Hence the advantage of passing over it a heavy roller after it had been sown or planted. Bearing this fact in mind, cultivators of the soil, whatever branch of husbandry they may be engaged in, will be governed accordingly, the principle here enunciated is all-controlling, and should never be lost sight of; being equally applicable to the raising of vegetables, wheat, or other cereal crops, as to the culture of plants and trees. The soil should, of course, be thoroughly pulverized in all cases, the surface alone being impacted with the roller where the drought is such as to indicate this mode of tillage.

PEACH FUNGUS.

BY DR. J. STRENTZEL.

Two years ago, in the orchards along the Sacramento River, was first observed the extended growth of a new fungus or lichen on peach trees, covering the fruit in ash-colored blotches, and the ends of growing shoots in detached masses, spreading from a cottony tuft of a growing germ. The leaves on the affected part drop off later in the season, and the end of the shoot generally dries up. The growth of the fruit is not apparently checked, but the thin-skinned varieties, on ripening, get a puckered-up, pocky, disgusting appearance. The earlier varieties are most affected; the yellow, among them the Crawford, not so much. None was noticed on the snow peach. The present year the disease has appeared in an extended circle, and is causing a greater injury to the fruit.

It is not pretended to assign a cause for this anomalous growth, beyond that the peculiar atmospheric condition was favorable to its rapid development. The trees may have been also depleted of vitality, or this having been an unpropitious year for the "curled peach leaf," the superabundant sap found a new parasitic consumer. But it can be reasonably hoped that some of the usual means employed for the destruction of kindred growths will be serviceable in this case. That the disease will certainly spread to all parts of California can be fully apprehended. The losses thus incurred would be severe to horticulturists. Thus it is of importance that every experience should be brought to public knowledge, and every means of extermination at once tried. The burning of the pruned offshoots should be rigidly followed; the ground around the trees scraped and limed, and the whole orchard repeatedly fumigated, early in Spring, in favorable weather, by keeping up numerous smoldering fires of spent tanbark, or damp straw mixed with asphaltum or coal tar. These are the most available means for the destruction not only of varieties of mildew, but also of innumerable noxious insects.

TAKING UP AND CUTTING BACK FRUIT TREES

AT PLANTING TIME.

BY E. J. HOOPER.

As the planting season is near at hand, I have concluded that a few practical observations, concerning the lifting and pruning of young fruit trees, is not out of place in this our November number of the *Horticulturist*. There is one thing respecting fruit trees which is deserving of more attention than it practically receives. I do not apply this so much to the heads of firms (although they should see and insist upon it) as to their foremen and those working under their instructions, and that is: that fruit trees should be taken up with more care than is generally practiced, under what is called the drawing system, by men who, it may be, are only employed for short periods, and who feel no particular interest in the way the work is done. I have seen beautiful fruit trees sent with their roots so chopped and ruptured, and also packed in such dry material, that those fine young trees, say two years of age—and that is as old as they should be purchased for all practical purposes—were scarcely so good as healthy maiden plants wrought in that or the previous season. There may be a chance, even for such trees, if planted very early in our rainy season; but if planted much later, and especially if rather late in the Spring, the shoots, if left, would most certainly become stunted, and if cut back, in opposition to the general rule that roots and tops should not be cut back at one and the same time, there is every chance that most of them would become nothing but poor sickly scrubs with feeble shoots. So much is there of fact in this representation, that many gardeners, on going to a nursery, not only choose their plants, but themselves see that they are carefully taken up, and the roots surrounded with damp mulching. Unless they can do this, they make it a point to order maiden plants; these they can train and move carefully, at pleasure. The training, as well as the proper removing of trees from the ground, is a matter of as much importance to nurserymen as to their customers. If trees are taken up with more care, even although a little more is charged, and if planters can only make up their minds to plant at the commencement of the rainy season, or very soon after it, then the cutting-back process—which as now practiced is sometimes nearly down to the stump of the young trained trees, thus rendering all the training of no avail—will soon be numbered among the things of the past.

Some nurserymen, when fruit trees are purchased rather early in the season, say in January, give instructions that peaches, plums, cherries, and apricots, should be much cut back when planted, and that apples and pears, bought at the same time, should stand over for that operation till the following Spring. Now, I see no use in this excessive mutilation. I can see very well the benefit to nurserymen of cutting back in a moderate degree annually; but I do not see any service to the purchaser of well trained nursery trees, if they have abundance of roots when taken up, of cutting back at all. Is the benefit, if any, equivalent to the postponement of bearing for one or two years longer than necessary, and also the risk, in many cases, of ruining the trees? The advocacy of some cultivators of the cutting-back system, at least to any great extent, cannot find any support, I think, in the *Horticulturist*. If the moving is effected at the proper time, and in the right manner, I hold, with no more cutting back than is required by the unripeness of the points of the shoots, and the necessity, in some cases, perhaps, for getting more shoots to fill up large spaces in the young trees, and to give them good symmetrical forms. I see, in short, no benefit to be derived from such mutilation; and the shortenings should only be resorted to when the shoots are not mature.

Training trees in a nursery to be lopped back, when transferred to a garden or orchard grounds, will probably go on until two practices are altered, and planters, as well as nurserymen, get freed from carelessness in this matter. Trees should be carefully planted soon after our first or second rains, about the beginning or middle of November, when the ground is warm enough, in our moderate climate, and when they have a long time before the dry season, in Spring, to encourage and produce plenty of fresh rootlets. If the trees are taken up carefully, and carefully sent, they will suffer very little. And if a few green leaves remain, they will serve to keep up the circulation, while an occasional dash from the hose, syringe, or a watering pot, and a slight shade in the hottest part of the day (although this latter suggestion will only apply in garden planting on a small scale), will prevent flagging and shriveling. The very lifting will induce a more perfect maturing of the wood, and, before frosts or drought can damage them, the plants will be able to hold their own. Such trees, with the soft points merely removed, will speedily lengthen and throw out healthy lateral shoots, and soon attain a fair size. Even if the planter cuts back pretty freely, the vigorous state of the roots will soon produce a correlative vigor of branches. In fact, two-year old, or somewhat older trees, are a good deal in a similar position when judiciously and moderately pruned, or cut back, to strong, healthy willow stools or grapevines, when pruned. None of these favorable characteristics, however, can exist in the case of trees imprudently taken up and transferred in a bundle to their destination, in March or April, then put into the ground at the coldest season of the year, as regards the soil, but with the increasing heat and dryness telling on them, chiefly when the buds are swelling and expanding into shoots, before there is healthy root action to supply their wants. Spring planters, consequently, unless they can use very extra care, have themselves, and not nurserymen, to blame for many of the evils and disappointments that sometimes ensue in our favorable climate and soil.

OUR CALIFORNIA FERNS.

BY F. A. MILLER.

Strange as it may seem, our native ferns are very little known, and hardly any of them are under cultivation with us or abroad. Within the last year I have paid much attention to ferns in general, and to our native varieties in particular, and I am pleased to say that a large number of them are very meritorious, and are much improved by proper cultivation. There are some which have not yet been classified by our botanists, and undoubtedly there will yet be found a great many species which are entirely unknown at the present time. I think, in another year, I shall be able to enumerate forty distinct species of native ferns.

At present we cultivate some twenty-five distinct varieties, and most of these seem to thrive exceedingly well under proper treatment. In making up collections of ferns our native kinds should not be overlooked, inasmuch as they form a decided contrast to those which are annually imported from foreign countries. There is no good reason why we should prefer foreign plants to our native ones, if these are as meritorious as the former; and yet, I must acknowledge the fact that I can sooner dispose of foreign ferns at a price five and ten times higher than we are in the habit of asking for our native varieties. For rockeries in the open air, our California ferns are preferable to any others, and, intermingled with foreign ferns in greenhouse or conservatory collections, they form a very desirable contrast.

The following varieties I have under cultivation now, and with few exceptions they have done well:

Polypodium Californicum is found nearly everywhere in California, growing upon shaded rocks. Under cultivation, the fronds grow much larger and finer, and almost upright. It requires no care whatever, and thrives best in a shady and moist situation. Fronds seven to eight inches long, and two inches wide, of a very bright green.

Polypodium Scouleri is one of the rarest ferns we have, and is a very distinct form. Fronds very fleshy lobed. The fruit dots upon the back of the frond are unusually large and showy. It is found upon rocks at the highest points of the Coast Range mountains, exposed to the heaviest winds; evergreen; behaves well under ordinary treatment; requires good drainage.

Pellæa andromedæfolia is one of a class well represented in California. All of them produce pretty and graceful fronds. This fern is of very light green color, with brown stems. It is much improved by cultivation, and is a strong grower. Its natural habitat is under the shade of shrubs and small trees.

Pellæa mucronata is of a more upright growth; fronds delicate and graceful; dark green, with a dark brown stem. Changes its habit very much, for the better, under cultivation. It is found upon bare, dry hillsides near the Coast Range.

Pellœa accuminata is the most graceful and delicate of this class; fronds of a sea-green color; leaflets in single rows; stems dark brown; slow grower, but otherwise improves under cultivation. It is found in the Sierra Nevada Mountains, at an elevation of about five thousand feet—not common.

Pellœa Bridgesii is one of the rarest and prettiest of our California ferns. The leaflets are large oval, of a downy white color; stem black, producing a most pleasing effect. It is extremely slow in adapting itself to cultivation; but I have now a number of the plants which are readily producing well developed fronds. It is found in the Sierra Nevada, at an elevation of six thousand to seven thousand feet, and grows upon bare, rocky bluffs, formed of limestone.

Pellœa densa is a pretty little dwarf-growing fern of a peculiar form, and of a very dark green color, with brown stems.

Pellœa sp., a variety not yet described, I found associated with *Pellœa Bridgesii;* fronds growing eight to ten inches high, of a downy white color; leaflets very small.

Gymnogramma triangularis—our California goldfern—is found in all parts of the State. It is easily cultivated, and deserves a place in every collection. Succeeds best if kept moderately moist and half shaded. The backs of the triangularly formed fronds are covered with bright golden yellow powder, with dark brown veins.

Woodwardia radicans, sp. Californica, differs from the *W. radicans* cultivated in Europe. The fronds of the former grow more upright and robust. However, our California variety is a most exquisite fern; well developed fronds reach the height of ten feet. The *Woodwardia* is very fond of moisture, and is found near springs and creeks. Under cultivation it thrives well, if an abundance of moisture is provided.

Aspidium Argutum is found plentifully all over California; its fronds are tender, and do not bear handling; color, light green.

Aspidium munitum is found in the ravines of the Coast Range mountains, and is undoubtedly the finest native fern. It is also found in the Sierra Nevada, but very rare, and, in my opinion, there are two distinct species. The one growing near the coast is a very strong grower, of upright habit, and light green color, while the other one, found in the Sierra Nevada, is of a dark green color, and its fronds spread close to the surface of the ground. Both are varieties well worth having, and easily cultivated.

Aspidium Californicum is my best grower, and can be most advantageously used for ferneries, rockeries, baskets, and bouquets, either in the shade or in exposed situations, in a moist or dry locality; its fronds are of a most pleasing form and color, always perfect.

Cheilanthes Californicum—a fern which is found plentifully in the Sierra Nevada, but which I have not yet succeeded in cultivating with any degree of success. The back of the frond is covered with a brown powder-like substance, while the face of it is of a very dark green color.

Cheilanthes gracillima is, I think, the most valuable of our ferns; of a most distinct form and character. The form of the frond is very pretty and graceful; the color is of a downy white, closely resembling that of *Cineraria maritima.* Very rarely found in the southern parts of the State.

Cheilanthes sp., a variety not yet described, and found near the boundary line of California and Arizona; of a more dwarfish growth than the former; equally as graceful; very rare.

Blechnum borealis, one of the best blechnums that ever came under my observation. The fronds are of good substance, and perfectly hardy; a really good fern, but not often met with, except in one or two localities of the northern part of California; plant worth having.

Cystopteris fragilis and *C. montana*, are two beautiful ferns of excellent habit and easy culture. They are found in the Santa Cruz Mountains, rather plentifully.

Botrychium sp., not yet described by any one. During last Summer, I found two distinct species, which I have now under cultivation, with very fair success. The fronds are most remarkably fleshy and spreading, of a dark green color. Another species found, produces much lighter fronds, of a light green color.

Asplenium ebeneum, a pretty plant lately discovered, and giving every indication that it will figure as a valuable addition to our ferns.

Dr. Kellogg says that he has found, during his recent stay in Yosemite Valley, a "*Woodsia.*" I have not yet been able to see the plant, and cannot say anything in regard to its merits; but it is evident that a good number will be added to those already known, during the next twelve months.

TRANSACTIONS

OF THE

BAY DISTRICT HORTICULTURAL SOCIETY

OF

CALIFORNIA,

FOR THE YEAR 1873.

OFFICERS OF THE SOCIETY.

Dr. A. Kellogg	President.
C. Stephens	Vice President.
F. A. Miller	Secretary.
H. Horst	Treasurer.

TRUSTEES AND DIRECTORS:

Dr. A. Kellogg,
C. Stephens,
F. A. Miller,
H. Horst,
Wm. Robertson,
J. H. Sievers,
Th. Brown.

REPORT.

San Francisco, November 18th, 1873.

To the honorable the State Board of Agriculture of the State of California:

Gentlemen: In presenting our annual report, in accordance with provisions of the law appropriating certain sums of money to the various agricultural and horticultural societies of California, we perform the duty with pleasure, knowing that we have done all in our power to advance the progress of horticulture and floriculture. We are also well aware of the fact that much more should be done to encourage the introduction of new trees and plants, both for practical use and ornament; the inauguration of new industries; the better development of our unlimited resources; the establishing of increased facilities for irrigation and a practical system of forest culture.

The financial affairs of the Bay District Horticultural Society of California are not in a condition, we are sorry to admit, to foster and advocate the feasibility of all these enterprises by practical demonstrations, otherwise than by our exhibitions of the horticultural products; and without the annual appropriation from the State for the purpose of offering and paying premiums to the best exhibits of our products, it would have been impossible to hold these horticultural exhibitions, as we demonstate by the subjoined report of our Secretary.

Permit us, if you please, to impress you particularly with the importance of introducing into our State additional and new trees, plants, and seeds, useful as well as ornamental; a proper method of acclimatizing, multiplying, and distributing the same all over the State, and to inaugurate a practical system of forest culture, which has now become a necessity. We gladly tender our services, if need be, to advocate proper measures before the Legislature of this State, which is to meet soon; and we hope most sincerely that some law will be enacted which may result in the accomplishment of the industries referred to. This society has the facilities of assisting materially in the introduction of foreign trees, plants, and seeds, and with a small appropriation from the State for that purpose, could make itself most useful to the whole State.

The society held two exhibitions during the year of eighteen hundred and seventy-three; one in Spring and another in Autumn. The expenses, as shown by the accompanying accounts, were much in excess of the receipts, and without the aid given by the State the exhibitions could not be held. We hope, therefore, that with your aid and good will, the Legislature will continue the appropriation for the coming two years.

Men of all classes of our population, and from all parts of the State, are becoming interested in the workings of our society, and within a few years we hope to be enabled to do all that may be expected from us, for the better development of the various horticultural industries.

Very respectfully,
A. KELLOGG, M. D.
C. STEPHENS.

SECRETARY'S REPORT.

To the officers and members of the Bay District Horticultural Society of California:

GENTLEMEN: In submitting this, my third annual report, to you, I cannot do otherwise but express a feeling of regret that our society is moving slow in accomplishing its mission, and unfortunately its financial condition is not of a very encouraging nature. The interest taken in the society's doings is not, I am very sorry to say, equal to the severe task of fostering and developing the horticultural and floricultural products which the State of California is capable of producing.

It cannot be denied that a horticultural society is a most important institution in a new country, and particularly so where the resources are unlimited. The usefulness of such a society consists not only in the discussion of subjects pertaining to horticulture, or in pointing out what our State might produce, or in exhibiting the products of our soil under the most favorable circumstances to the public, but to be of practical service to our State, and to the people who occupy its lands, the discussions and deliberations of practical men should be made public and disseminated throughout the rural districts; the trees and shrubs and plants, of a useful as well as an ornamental character, which you consider adapted to our soil and climate, should be introduced by you and acclimatized, in order that you may demonstrate, practically, their fitness and usefulness; and in your exhibitions you should demonstrate beyond a doubt, the result and success, with all its variations, brought about by the influences of soil, climate, and other conditions.

This, I am well aware, cannot be done with the resources at your command at the present time, which are barely sufficient to cover the expense of room rent, gas, and petty incidentals. To enable you, therefore, to make yourself more useful to the public, you must increase your revenues, which, at present, can only be done by adding regular members. It would be strange indeed if the population of California could not or would not sustain an institution of this kind, and swell the list of regular members to a number sufficient to accomplish your purpose. It is my candid opinion that a strong effort to do this has not been made yet. I would also call your attention to that portion of your constitution and by-laws which grants life membership on payment of twenty-five dollars, which is too small an amount compared with the requirements of other less important and less useful societies.

It is true, during the past year a class of men were admitted as members of this society of which we may well be proud, but there are hundreds more, I believe, who would help you along financially and practically if their aid was solicited in a proper way.

It is the opinion of horticulturists of this State that an experimental garden should be established here for the purpose of introducing new and desirable trees, plants, etc. Such a garden might be properly conducted under your supervision, if a suitable appropriation would be made by the State for that purpose, and an immense benefit could be derived from it.

The subject of forest culture has been thoroughly discussed during the last two years, and our scientific men are unanimous as to the many benefits which the State would derive from a propagation of forest culture. Your society should be a strong advocate of this industry, and be instrumental in soliciting proper legislation on the subject.

We have no one to protect and advance the interest of horticulture on this coast. The politicians seem to have no time for the consideration of laws intended to create useful internal improvements. We must show a bold front, and demand proper legislation for the development of our most important resources and industries.

In the laying out and the maintenance of our public squares, parks, and grounds, many abuses and blunders have been committed, and thousands of dollars have been squandered by injudicious management. Contracts have been made without due public notice, in favor of a few, when, in many cases, evidence can be procured that the work of laying out grounds, furnishing material, trees, and shrubs, could be done much better and in a more workmanlike manner for one half the amount actually paid. I think the attention of the public should be called to these defects, and the officials who have the management of these affairs should be exposed.

During the year eighteen hundred and seventy-three the society held two exhibitions—one in Spring and another in Autumn. While the Spring exhibition was confined to the display of useful and ornamental trees, shrubs, and plants, the Autumn exhibition was well represented by a general display of all horticultural, floricultural, and pomological products. Both of these exhibitions were most meritorious, and the highest praise is due to all who aided in the efforts of the society to make the display worthy of the reputation which California enjoys, home and abroad. The arrangements in the hall for the Spring exhibition were in the most pleasing and elegant style, and nothing could be wished for to make the display a more successful one. At the Autumn exhibition, the fruit department was most complete, and the best ever made in San Francisco. The exhibition of apples was the best ever made in the State.

In the department of plants, new and rare plants of recent introduction were most promising features, and attracted universal attention.

The quality of trees and plants was invariably better than ever before, and our nurserymen and florists showed a great deal of perseverance and sacrifice of time in cultivating specimens particularly and especially for the exhibitions. In regard to variety and quality of plants, it is conceded that much has been gained during the past two years.

A most meritorious display of preserved fruits and jellies was exhibited, which was certainly the best ever placed on exhibition in San Francisco.

Although the society may well feel proud in accomplishing so glorious a result, it is a most lamentable fact that both of the exhibitions were financial failures, the society sustaining severe losses, which demonstrates clearly, that without the aid of a suitable appropriation from the State, similar to the one made for the past two years, it would be impossible to continue similar exhibitions. For this reason alone, besides many others, it is to be hoped that the Legislature, which is to meet during the coming Winter, will act promptly in voting the necessary aid for the continuance of our horticultural exhibitions.

Various circumstances plainly point out the error which was made in holding two exhibitions in one year, and the suggestion is timely, that one exhibition annually is all that can be expected.

Much gratified by the appreciation of our untiring labors to advance horticulture and floriculture in all their branches, and encouraged by a strong hope that during the coming year the revenues of the society will be increased threefold,

I am, respectfully yours,

F. A. MILLER,
Secretary Bay District Horticultural Society.

FINANCIAL STATEMENT.

STATEMENT OF ACCOUNTS—RECEIPTS AND EXPENDITURES OF SPRING EXHIBITION OF 1873.

DR.

To cash by sale of season tickets	$728 50
To cash by single admissions to exhibition	1,785 75
To cash by stand privileges	68 00
To cash by sale of material	50 05
To cash by balance	2,652 25
Total	$5,284 55

CR.

By sundry expenses	$160 80
By decoration of hall	590 55
By rent for hall	920 00
By labor	336 75
By premiums to children	93 95
By printing and advertising	630 55
By plumber and gasfitter	78 40
By insurance	33 75
By music—eleven days	799 75
By premiums paid	1,304 30
By plants presented to children	72 75
By Secretary's salary	150 00
By carpenter work	113 00
Total	$5,284 55

RECEIPTS AND EXPENDITURES OF AUTUMN EXHIBITION OF 1873.

DR.

To cash by sale of season tickets	$213 50
To cash by single admissions	1,004 00
To cash by stand privileges	8 25
To cash by sale of material	38 50
To cash by balance	673 85
Total	$1,938 10

CR.

By sundry expenses	$42 35
By rent for hall	400 00
By labor	64 50
By carpenter work	39 25
By printing and advertising	102 50
By music	405 50
By premiums awarded	884 00
Total	$1,938 10

GENERAL ACCOUNT OF THE BAY DISTRICT HORTICULTURAL SOCIETY FOR 1873.

DR.		CR.	
To cash by membership dues	$708 45	By rent of reading room	$120 00
To cash by dividends hall stock	120 00	By liquidation of promissory note	690 00
To cash by sale of hall stock	1,036 00	By collector's fees	130 80
To cash by State appropriation	2,000 00	By interest on note	36 00
To cash advanced by members	800 00	By incidental expenses	37 30
		By printing	99 25
		By periodicals for reading room	37 50
		By discount on State warrant	140 00
		By deficiency of Spring exhibition	2,652 25
		By deficiency of Autumn exhibition	673 85
		By balance	47 50
Total	$4,664 45	Total	$4,664 45

AWARDS OF PREMIUMS AT SPRING EXHIBITION, 1873.

CLASS I—PLANTS.

Articles.	Exhibitors.	Premiums.
Flowering plants in bloom	E. Meyer	First prize, $50
Flowering plants in bloom	E. L. Reimer	Second prize, $30
Flowering plants in bloom	F. Lüdemann	Third prize, $15
Evergreens of Australia	E. L. Reimer	First prize, $30
Evergreens of Australia	F. Lüdemann	Second prize, $10
Coniferæ	E. L. Reimer	First prize, $30
Conservatory and greenhouse plants	E. Meyer	First prize, $25
Conservatory and greenhouse plants	Miller & Sievers	Second prize, $15
Bedding plants	F. Lüdemann	First prize, $15
Hardy ornamental foliage plants	E. L. Reimer	First prize, $10
Hardy ornamental foliage plants	F. Lüdemann	Second prize, $5
Tender ornamental foliage plants	R. B. Woodward	First prize, $30
Special mention of extra culture	Miller & Sievers	Second prize, $15
Special mention of extra culture	F. Lüdemann	Third prize, $8
Tropical plants	R. B. Woodward	First prize, $40
Climbing plants	E. Meyer	First prize, $15
Climbing plants	E. L. Reimer	Second prize, $10
Climbing plants	F. Lüdemann & Co	Third prize, $5
New and rare plants	E. Meyer	First prize, $30
New and rare plants	F. Lüdemann & Co	Second prize, $20
New and rare plants	E. L. Reimer	Third prize, $10
New and rare plants	Miller & Sievers	Commendable
Plants for hanging baskets and rock work	F. Lüdemann & Co	First prize, $8
Plants for hanging baskets and rock work	E. L. Reimer	Second prize, $4
Ferns	Miller & Sievers	First prize, $15
Ferns—ten specimens	R. B. Woodward	First prize, $15
Ferns—five specimens	Miller & Sievers	First prize, $8
Ornamental grasses	Miller & Sievers	First prize, $8
Roses in bloom	E. L. Reimer	Third prize, $15
Cinerarias	E. Meyer	First prize, $12
Coleus	F. Lüdemann & Co	First prize, $10
Coleus	Miller & Sievers	Second prize, $5
Fuchsias	F. Lüdemann & Co	First prize, $20
Fuchsias	E. L. Reimer	Second prize, $10
Fuchsias	Miller & Sievers	Third prize, $5
Double geraniums	E. L. Reimer	First prize, $10
Double geraniums	F. Lüdemann & Co	Second prize, $5
Variegated leaf geraniums	E. L. Reimer	First prize, $10
Variegated leaf geraniums	F. Lüdemann & Co	Second prize, $5
Zonale geraniums	F. Lüdemann & Co	First prize, $10
Zonale geraniums	E. L. Reimer	Second prize, $5
Flowering begonias	Miller & Sievers	First prize, $8
Variegated leaf begonias	R. B. Woodward	First prize, $8
Auriculas and primulas	Miller & Sievers	First prize, $10
Pansies	F. Lüdemann & Co	First prize, $10
Pansies	E. Meyer	Second prize, $5
Verbenas	Miller & Sievers	Second prize, $8
Pinks	E. Meyer	First prize, $15
Pinks	F. Lüdemann & Co	Second prize, $10
Petunias	Miller & Sievers	First prize, $6
Camellias in bloom	E. Meyer	Second prize, $10
Five best grown plants	F. Lüdemann & Co	First prize, $5
Plants indigenous to California	Miller & Sievers	First prize, $20

CLASS I—PLANTS—Continued.

Articles.	Exhibitors.	Premiums.
Rustic hanging baskets	Miller & Sievers	Second prize, $4
Wire hanging baskets	Miller & Sievers	Second prize, $3
Coniferæ cones	C. Stephens	First prize, $10
Rustic flower stand	Miller & Sievers	First prize, $8
Wire flower stand	Miller & Sievers	First prize, $6
Square fern case	E. Meyer	First prize, $20
Round fern case	Miller & Sievers	First prize, $8
Cut flowers	F. Lüdemann & Co	First prize, $15
Cut flowers	E. Meyer	Second prize, $10
Cut roses	E. L. Reimer	First prize, $10
Cut roses	Miller & Sievers	Second prize, $6
Cut roses	F. Lüdemann & Co	Third prize, $3
Cut pansies	F. Lüdemann & Co	First prize, $5
Cut pinks	Miller & Sievers	First prize, $5
Cut pinks	F. Lüdemann & Co	Second prize, $3
Cut pinks	E. Meyer	Third prize, $1

CLASS IV—FLOWERS.

Article.	Exhibitor.	Premium.
Basket of flowers	A. Duhen, with Miller & Sievers	First prize.
Basket of flowers	E. Meyer	Second prize.
Pyramid bouquet		First prize.
Round bouquet	E. Meyer	First prize.
Round bouquet	A. Duhen, with Miller & Sievers	Second prize.
Wedding bouquets	E. Meyer	First prize.
Wedding bouquets	A. Duhen, with Miller & Sievers	Second prize.
Funeral wreath	Hugo Leopold, with Miller & Sievers	First prize.
Funeral wreath	E. Meyer	Second prize.
Cross	Hugo Leopold, with Miller & Sievers	First prize.
Cross	E. Meyer	Second prize.
Flat bouquet	A. Duhen, with Miller & Sievers	First prize.

AWARD OF PREMIUMS AT AUTUMN EXHIBITION, 1873.

CLASS I—PLANTS.

Articles.	Exhibitors.	Premiums.
Flowering plants, in bloom	E. L. Reimer	Second prize, $25
Australian evergreens	E. L. Reimer	First prize, $25
Coniferæ	E. L. Reimer	First prize, $25
Greenhouse and conservatory plants	Miller & Sievers	First prize, $30
Greenhouse and conservatory plants	E. Meyer	Second prize, $20
Greenhouse and conservatory plants	E. L. Reimer	Third prize, $10
Hardy ornamental foliage plants	E. L. Reimer	First prize, $15
Tender ornamental foliage plants	R. B. Woodward	First prize, $25
Tender ornamental foliage plants	Miller & Sievers	Second prize, $15
Tender ornamental foliage plants	E. E. Moore	Third prize, $8
Tropical plants	R. B. Woodward	First prize, $20
Hardy climbers	E. L. Reimer	First prize, $15
Tender climbers	Miller & Sievers	Second prize, $8
New and rare plants	Miller & Sievers	First prize, $30
New and rare plants	E. Meyer	Second prize, $15
Plants for hanging baskets and rockwork	E. L. Reimer	Second prize, $4
Ferns	E. Meyer	First prize, $20
Ferns	Miller & Sievers	Second prize, $10
Coleus	E. L. Reimer	First prize, $10
Coleus	Miller & Sievers	Second prize, $5
Fuchsias	E. L. Reimer	First prize, $20
Fuchsias	Miller & Sievers	Second prize, $12
Double geraniums	E. L. Reimer	Second prize, $5
Variegated-leaf geraniums	E. L. Reimer	First prize, $15
Zonale geraniums	E. L. Reimer	Second prize, $5
Ornamental foliage begonias	E. E. Moore	First prize, $10
Caladiums	Miller & Sievers	First prize, $12
Marantas	Miller & Sievers	First prize, $10
Primulas	Miller & Sievers	First prize, $8
California native plants	Miller & Sievers	First prize, $10
Japanese plants	E. E. Moore	First prize, $10
Best grown plants—twenty specimens	E. L. Reimer	First prize, $20
Best grown plants—ten specimens	Miller & Sievers	First prize, $10

CLASS II—MISCELLANEOUS.

Article.	Exhibitor.	Premium.
Rustic hanging basket	E. E. Moore	First prize, $8
Wire hanging baskets	E. L. Reimer	First prize, $6
Wire hanging baskets	Mrs. Hoffman	Second prize, $3
Rustic flower stand	Miller & Sievers	First prize, $8
Wire flower stand	Miller & Sievers	First prize, $6
Wire flower stand	Mrs. Hoffman	Second prize, $3
Coniferæ cones	C. Stephens	First prize, $10
Square fern case	M. H. Lester	First prize, $10
Round fern case	Miller & Sievers	First prize, $5

CLASS III—CUT FLOWERS.

Article.	Exhibitor.	Premium.
Cut flowers	E. L. Reimer	First prize, $15
Cut flowers	Wm. Robertson	Second prize, $10
Gladiolus	Miller & Sievers	First prize, $8
Cut roses	Wm. Robertson	First prize, $10
Cut roses	Miller & Sievers	Second prize, $6
Cut pinks	Miller & Sievers	First prize, $4
Cut dahlias	M. Malmgren	First prize, $6
Cut dahlias	Miller & Sievers	Second prize, $3

CLASS IV—BOUQUETS.

Article.	Exhibitor.	Premium.
Pyramid bouquet	E. L. Reimer	First prize, $4
Wedding bouquet	Wm. Robertson	First prize, $5
Funeral wreath	Wm. Robertson	First prize, $6
Funeral cross	Wm. Robertson	First prize, $6
Flat bouquet	E. L. Reimer	First prize, $2
Basket of flowers	Miller & Sievers, by August Duhen	First prize, $8
Funeral cross	Miller & Sievers, by August Duhen	Diploma.
Floral design	Miller & Sievers, by August Duhen	First prize, $20

CLASS V—FRUITS.

Article.	Exhibitor.	Premium.
Best collection of fruits	D. C. Young	$20
Best collection of apples	D. C. Young	$10
Best twelve varieties of apples	D. C. Young	$5
Best collection of pears	D. C. Young	$10
Best twelve varieties of pears	D. C. Young	$5
Best collection of peaches	D. C. Young	$6
Best collection of prunes	John Rock	$5
Best collection of quinces	D. C. Young	$3
Best collection of figs	D. C. Young	$3
Best collection of foreign grapes	W. B. West	$20
Best twelve varieties of wine grapes	D. C. Young	$10
Best twelve varieties of table grapes	D. C. Young	$10
Best exhibit of preserved fruits	J. M. Odbert	First prize and diploma $25
Meritorious exhibit of fruit branches	D. C. Young, of Sonoma.	
Meritorious exhibit of fruit branches	C. W. Stevens, of San Lorenzo	
Exhibit of quince seedling	D. C. Young	Hon. mention.

WINES AND LIQUORS.

Article.	Exhibitor.	Premium.
California white wine	H. Winkle	Hon. mention.
Gutedel	H. Winkle	Diploma.
Zinfendal	H. Winkle	Hon. mention.
Claret	H. Winkle	Diploma especially recommended.

TRANSACTIONS

OF

The Santa Clara Valley Agricultural Society,

FOR

THE YEAR 1873.

REPORT.

To the honorable the State Board of Agriculture of the State of California:

Gentlemen: Pursuant to the statute in that behalf enacted, I have the honor to submit the following report of the proceedings of the Santa Clara Valley Agricultural Society, for the year eighteen hundred and seventy-three:

FINANCIAL EXHIBIT.

To amount cash on hand, 1873		$12,413 76
To amount received, 1873		1,157 35
To amount State appropriation		2,000 00
DISBURSEMENTS.		
By amount paid premiums	$2,323 00	
By amount paid improvements on grounds	2,927 32	
By amount paid purses and current expenses	6,399 42	
By amount cash on hand	3,921 37	
	$15,571 11	$15,571 11

PREMIUMS AWARDED AT THE PAVILION.

GARDEN PRODUCTS.

Article.	Exhibitor.	Premium.
Best sack onions	John Trimble	$3
Beets	O. C. Wells	$5
Melons	O. C. Wells	$2
Carrots and rhubarb	O. C. Wells	Special prem.
Collection garden seeds	Scrivani Capelli & Co.	$5
Sack potatoes	Scrivani Capelli & Co.	$3
Green beans	Scrivani Capelli & Co.	$3
Cucumbers	Scrivani Capelli & Co.	$3
Tomatoes	Scrivani Capelli & Co.	$2
Turnips	Scrivani Capelli & Co.	$2
Sugar beets	Scrivani Capelli & Co.	$5
Collection of all kinds vegetables	Scrivani Capelli & Co.	$10
Squashes	Jesse Hobson	$2

FRUIT.

Article.	Exhibitor.	Premium.
Best single bunch foreign grapes	Isaac Dixon	$3
Collection apples, all varieties	B. S. Fox	$15
Twelve varieties apples	B. S. Fox	$10
Collection pears, all varieties	B. S. Fox	$15
Twelve varieties pears	B. S. Fox	$10
Collection plums	B. S. Fox	$10
Quinces	B. S. Fox	$5
Pears, single variety	Mrs. Joseph Lee	Special prem.
Collection apples, single variety	J. R. Lowe, Sr.	$5
Peaches	J. R. Lowe, Sr.	$5
Collection prunes	John Rock	$5
Collection pomegranates	John Rock	$5
Collection foreign grapes	John Rock	$3
Collection wine grapes	S. P. Stockton	$10
Single bunch Mission grapes	S. P. Stockton	$10
	S. P. Stockton	$3
Canned Fruit.		
Best exhibit pickles	Mrs. J. L. Armstrong	$5
Sweet pickles	Mrs. J. L. Armstrong	$2
Exhibit canned fruit	J. M. Dawson & Co.	$10
Exhibit hermetically sealed in bottles	J. M. Dawson & Co.	$10
Preserved and Dried Fruit.		
Best exhibit domestic dried fruit	L. A. Gould	$10
Exhibit dried prunes	L. A. Gould	$5
Exhibit dried apples	L. A. Gould	$2
Exhibit dried pears	L. A. Gould	$2
Exhibit dried apricots	L. A. Gould	$2
Exhibit dried peaches	L. A. Gould	$2
Exhibit dried plums	L. A. Gould	$2
Exhibit dried currants	L. A. Gould	$2
Exhibit dried blackberries	L. A. Gould	$2

NUTS.

Article.	Exhibitor.	Premium.
Best collection all kinds California raised nuts	B. S. Fox	$10
Collection soft-shell almonds	B. S. Fox	$3
Collection chestnuts	Mrs. Jos. Lee	$2
English walnuts, California raised	Wm. Boots	$2

PLANTS AND FLOWERS.

Article.	Exhibitor.	Premium.
Best collection cut roses and dahlias	John Rock	$5
Collection assorted plants of all varieties	L. F. Sanderson	$10
Collection roses in pots	L. F. Sanderson	$5
Two vases bouquets	L. F. Sanderson	$5
Parlor bouquets	L. F. Sanderson	$5
Hand bouquets	L. F. Sanderson	$2
Collection fern leaves and plants	L. F. Sanderson	$10
Collection greenhouse plants	L. F. Sanderson	$25
Fuchsias, geraniums, heliotropes, callas	L. F. Sanderson	$10
Collection hardy ornamental evergreen plants	John Rock	$25

NATIVE WINES AND LIQUORS.

Article.	Exhibitor.	Premium.
Best exhibit	Charles LeFranc	$15
Madeira wine	D. M. Harwood	$5
Claret	Charles LeFranc	$5
Catawba	S. P. Stockton	$5
Grape brandy	D. M. Harwood	$5
Second best grape brandy	Charles LeFranc	Spec. premium.
Pear brandy	S. P. Stockton	$5
Vinegar	Charles LeFranc	$5
Red wine	S. P. Stockton	$5
White wine	Charles LeFranc	$5
Port wine	S. P. Stockton	Spec. prem. rec.

DAIRY PRODUCE.

Article.	Exhibitor.	Premium.
Best cheese	Isaac Dixon	$10
Butter	Wm. Boots	$5

BREAD AND PASTRY.

Article.	Exhibitor.	Premium.
Best domestic brown bread	Mrs. H. E. Hills	$2
Wheat bread	Mrs. H. E. Hills	$2
Wheat bread	Nellie Kenyon	Prem. recom'd
Exhibit pastry	Mrs. B. Montgomery	$5
Sugar and syrups	Isaac Dixon	$5

MILLINERY AND DRESSMAKING.

Article.	Exhibitor.	Premium.
Best display ladies bonnets and hats	Madame Loryea	$15
Straw bonnets and hats	Madame Loryea	$10

EMBROIDERY, NEEDLE AND FANCY WORK.

Article.	Exhibitor.	Premium.
Best wax work	Mrs. C. W. Clark	$2
Display silk embroidery	Miss D. M. McChain	$5
Worsted work	Miss D. M. McChain	$2
Crochet	Miss D. M. McChain	$2
Child's clothes	Miss D. M. McChain	$5
Chenille work	Miss D. M. McChain	$2
Moss work	Mrs. A. B. Weaver	$2
Embroidered carriage robes	Mrs. J. G. Bray	Premium rec'd
Fancy toilet set	Mrs. A. B. Post	Premium rec'd
Cambric embroidery	Mrs. A. B. Post	$5
Crochet work	Miss A. L. Armstrong	Premium rec'd
Wax work	Miss L. J. Armstrong	Premium rec'd
Cone work	Miss Carrie Martin	$2
Rug	Mrs. C. F. Singletary	$5
Sofa pillow	Miss Nettie Peelor	$2
Netting work	Miss Maggie Quinn	$2
Silk embroidery	Mrs. E. M. Bradley	Premium rec'd
Feather work	Miss Henrietta Headen	$2
Wax work	Mrs. Yeaton	Premium rec'd
Ornamental leather work	Mrs. Yeaton	$2

SEWING MACHINES.

Article.	Exhibitor.	Premium.
Machine for all purposes	A. C. Feeler	Diploma
Exhibit machine work	A. C. Feeler	$5

PAINTING AND GRAINING.

Article.	Exhibitor.	Premium.
Best exhibit carriage painting	M. Castro	$10
Second best exhibit carriage painting	C. T. Bracket	$5
Graining on wood	H. G. Jarman	$10

FINE ARTS.

Article.	Exhibitor.	Premium.
Best oil portrait	Miss Gussie Caldwell	$10
Landscape, California scenery	Miss Gussie Caldwell	Hon. mention
Landscape, California scenery	Mrs. J. G. Bray	$10
Oil painting on canvas	Mrs. J. G. Bray	$10
Water color painting	Harold Peelor	$5
Crayon drawing	Miss M. Bray	$5
Crayon pastel painting	Mrs. D. R. Beckford	Special prem.
Exhibit marble work California manufacture	DeLong, Coombs & Co.	$20
Exhibit sculpture	DeLong, Coombs & Co.	$20
Exhibit sculpture	J. H. Russel	Special prem.
Christian Graces	Geo. Brewer	Special prem.

POTTERY.

Article.	Exhibitor.	Premium.
Exhibit pottery	A. Steiger	$10

STOVES AND TIN WARE.

Article.	Exhibitor.	Premium.
Exhibit stoves of any make, and exhibit tin ware	M. Campbell	$10

DOMESTIC MANUFACTURES.

Article.	Exhibitor.	Premium.
Pair woolen blankets	San José Woolen Mills	$10
Exhibit men's clothing	San José Woolen Mills	$5
Ten yards flannel	San José Woolen Mills	$10
Ten yards woolen cloth	San José Woolen Mills	$10
Ten yards woolen manufactures	San José Woolen Mills	$20
Home-made carpet	William Dumont	$10
Exhibit hats and caps	J. S. Woods	$5
Patchwork quilt	Mrs. A. P. Post	Prem. recom'd.

MISCELLANEOUS.

Article.	Exhibitor.	Premium.
Best exhibit silk ribbons	Joseph Green	$10
Exhibit straw paper	Saratoga Mills	$10
Exhibit silk thread	California Silk Manufacturing Company	
Exhibit cocoons	F. J. Sauffrignon	$5
Raw silk	W. P. Higginbotham	$5
Home-made cotton bedquilt	Mrs. M. E. Saxe	Prem. recom'd.
Home-made cotton bedquilt	Mrs. Rogers	$2
Display plain needlework	Mrs. W. C. Wilson	Prem. recom'd.
		$5

HAND TOOLS.

Article.	Exhibitor.	Premium.
Patent rubber washing machine	Henderson & Snyder	Diploma.
Corn sheller, hay cutter, and challenge feed mill	M. C. Hawley & Co.	Hon. mention.
Sluthour pump	Keeler, Hine & Thomas Company	
Pump valve	Fred. Klein	Diploma.
Lawn sprinkler	M. C. Hawley & Co.	Diploma.
		Hon. mention.

IRON AND WOODWORK.

Article.	Exhibitor.	Premium.
Best exhibit iron castings	D. McKenzie	$10
Wood carving	Matilda Lotz	$5
Exhibit brass work	D. McKenzie	$5
Needle oiler	Joseph Enright	Hon. mention.
Glass water gauge	Joseph Enright	Prem. recom'd.

HARNESS AND SADDLERY.

Article.	Exhibitor.	Premium.
Best exhibit harness and saddlery work	H. Messing	$15
Lady's saddle	M. Stern	$5
Buggy harness, double	M. Stern	$10
Buggy harness, single	H. Messing	$10
Set farm harness	H. Messing	$10
Gent's saddle	M. Stern	$5

TANNED LEATHER.

Article.	Exhibitor.	Premium.
Best exhibit tanned leather, harness leather, sole leather, upper leather, and exhibit of ground squirrel skin gloves, tanned	Eberhardt	$40

BOOTS AND SHOES.

Article.	Exhibitor.	Premium.
Best exhibit boots and shoes, California made	E. J. Wilcox	$10

FARM PRODUCTS.

Article.	Exhibitor.	Premium.
Best sack wheat	T. Scully	$5
One sack barley	John Stanfield	$5
One sack oats	John Trimble	$5
Exhibit flax seed	Isaac Dixon	$5
Exhibit side bacon	Joseph Delmas	$5
Exhibit salt pork	Joseph Delmas	$5
Exhibit smoked beef	Joseph Delmas	$5
Exhibit growing corn	Jesse Hobson	$5
Exhibit California made cigars	Max Schoen	$10
Exhibit hams	A. Matty	$5
Exhibit ten pounds lard	A. Matty	$5
Exhibit boned ham	A. Matty	Premium recommended.
Exhibit one sack Sonora wheat	W. Quinn	Premium recommended.

WAGONS AND CARRIAGES.

Article.	Exhibitor.	Premium.
Best express wagon	J. C. Horner	$20
Second best express wagon	H. W. Fabing	
One-horse open buggy	Johnson & Reardon	$10
Two-horse open buggy	Johnson & Reardon	$10
Family carriage	Haskell & Mott	$20
One-horse top buggy	W. T. Adel	$15
Two-horse top buggy	W. T. Adel	$10

PRESERVES AND JELLIES.

Article.	Exhibitor.	Premium.
Best exhibit of preserves	Mrs. H. E. Hills	$5
Exhibit of jellies	Mrs. L. J. Watkins	$10
Second best exhibit of jellies	Mrs. H. E. Hills	$5
Second best exhibit of preserves	J. M. Dawson & Co	$3

CABINET WARE.

Article.	Exhibitor.	Premium.
Best exhibit of chamber furniture	H. Milmeister	$10
Parlor furniture	J. P. Goodwin & Co	$10
Easy chair	J. P. Goodwin & Co	$5
Upholstery	J. P. Goodwin & Co	$5
Cabinet ware	J. P. Goodwin & Co	$15
Spring bed	J. J. Hattabaugh	$5

SPECIAL AND DISCRETIONARY.

Article.	Exhibitor.	Premium.
Best collection of hair work	L. J. Duparque	$10
Second best collection of hair work	Mrs. Demar	Diploma.
Automatic clothes reel	J. Brizee	Hon. mention.
California chemical paint		Diploma.
Bird cage	Paul Lotz	Premium.
Curiosities	S. Tonner	Hon. mention.
Fleece wool	B. F. Watkins	Premium.
Fountain, iron settee, and chair	Keeler, Hines & Thomas Co	Prem. recom'd.
Babcock fire extinguishers		Dipl'a recom'd.
Rustic window shades	A. E. Pomeroy	Hon. mention.
California snuff	M. G. Monteverde	Dipl'a recom'd.
Terra cotta work	T. C. Natival	Dipl'a recom'd.
Bright Union safety lamp	I. L. Merrill	Dipl'a recom'd.
Grand Excelsior American chart	Mrs. S. L. Maston	Diploma.

PREMIUMS AWARDED AT THE STOCK GROUNDS.

Animal.	Name.	Exhibitor.	Premium.
Thoroughbred horses.			
Best stallion, three years old and upwards	Ironclad	John Hall	$30
Sucking colt	Rob't. Wooding	Wm. Boot	$10
Mare, three years old and upwards	Alpha	R. T. O'Hanlon	$20
Mare, two years old	Fannie	Wm. H. Hall	$15
Mare, one year old	No name	R. T. O'Hanlon	$10
Sucking filly	Bay filly	John Hall	$10
Families.			
Best stallion with family of six or more colts	Ethan Allen, Jr	Wm. Hamilton	$50
Horses for all purposes.			
Best stallion, three years old and upwards	British Champion.	C. J. Buckland	$30
Stallion, two years old	Justice	Wm. Hamilton	$20
Stallion, one year old	Abdallah, Jr	Robert Welch	$10
Suckling colt	Clarence King	Alex. Anderson	$10
Best mare, three years old and upwards	Mary Jane	G. K. Hostetter	$10
Mare, two years old	Edith	Wm. Hamilton	$20
One year old filly	Kate Singer	John Rhode	$15
Sucking filly	Bay filly	Wm. Boots	$10
Roadsters.			
Best stallion, four years old and over	G. M. Patchen, Jr.	Wm. Mathews	$30
Stallion, two years old	Orphan Boy	Wm. H. Hall	To be fixed
Stallion, three years old	Gib George	Wm. Mathews	$20
Best mare, four years old	Lady Lightfoot	T. W. Savage	$20
Mare, three years old	Fannie Allen	W. Hamilton	$15
	Mambrino	— Carr	Spec. pr. rec.

Animal.	Name.	Exhibitor.	Premium.
California draft horses.			
Best stallion, three years old and upwards	Suffolk	Massey Thomas	$30
Stallion, two years old	Stonew'll Jackson.	James Dunn	$20
Stallion, one year old	Fred. Douglas	Thomas Blake	$10
Best mare, three years old and upwards	Jennie	J. P. Dudley	$20
Mare, two years old	Jennie Robinson	Thomas Blake	$15
Mare, one year old	Dolly	Truman Andrews	$10
Pair of draft horses, in harness	Peggy and Maggy	W. M. Boots	$20
Imported draft stallion, three years old and over	Capt. Tomson	Thomas Blake	$30
Carriage horses.			
Best span of carriage horses, owned and used as such by one man	Bob and Henry	Ben. Fish	$20
Single buggy horse	George	John Q. Pearl	$10
	Geo. Washington.	John Barry	Special rec.
	General Jackson	John Barry	Special rec.
Graded horses.			
Best stallion, three years old	Belmont Patchen	Geo. M. Williamson.	$30
Stallion, two years old	Billy Mathews	M. Schallenberger	$20
Stallion, one year old	Frank Malone	Wm. Hamilton	$10
Colt, under one year	Standard	Wm. Hamilton	$10
Mare, four years and over, with colt	Victress	M. Schallenberger	$20
Mare, two years old, with colt	Santa Clara	Wm. Hamilton	$10
Sweepstakes.			
Best stallion, of any breed or age	Geo. M. Patchen	Wm. Mathews	$30
Mare, of any breed or age	Victress	M. Schallenberger	$20
Saddle horses.			
Best saddle horse	Louisa Johnson	C. H. Worthington	Special rec.
Mules.			
Best pair of mules, owned by one man	Fannie and Puss	E. L. Bradley	$10
Yearling	Jennie	C. H. Worthington	$5
Durham cattle.			
Best Durham bull, four years old and upwards	Glencoe	Colonel Younger	$30
Durham bull, three years old	Romeo	Carr & Chapman	$20
Durham bull, two years old	Tempest	Wm. H. Hall	$15
Durham bull, one year old	Emmet Third	Wm. Quinn	$10
Durham bull calf of 1873	Mark Hopkins	Colonel Younger	$10
Durham cow, four years old and upwards	Lady Solway	Carr & Chapman	$20
Durham cow, three years old	Norma	Colonel Younger	$15
Durham cow, two years old	Jennie	Colonel Younger	$15
Durham cow, one year old	Pet of Geneva	Carr & Chapman	$10
Durham heifer of 1873	Mollie	Carr & Chapman	$10

CATTLE—Continued.

Animal.	Name.	Exhibitor.	Premium.
Devons.			
Best Devon bull, three years old and upwards	Devonshire Billy	Thos. Blake	$30
Alderneys.			
Best bull, three years old and upwards	Brian 'Boru	John Cooney	$15
Bull, two years old	Prince John	C. B. Polhemus	$10
Bull, one year old	Yankee Doodle	John Cooney	$5
Bull calf of 1873	Prince Arthur	C. B. Polhemus	$5
Cow, three years old and upwards	Princess Royal	C. B. Polhemus	$10
Cow, two years old	Princess Louise	C. B. Polhemus	$10
Holsteins.			
Best bull, three years old and upwards	Oppideos Eighth	S. B. Emerson	$30
Calf of 1873	Fritz	S. B. Emerson	$10
Sweepstakes.			
Best bull, of any breed or age	Old Sam	Carr & Chapman	$30
Cow, of any breed or age	Lady Solway	Carr & Chapman	$20
Dairy cow	Hannah	Wm. Quinn	$15
Beef cattle.			
Best pair of beef cattle	Duke Bernard and Butler	E. C. Singletary	$10
Graded cattle.			
Best cow, three years old and upwards	Susana	A. Underwood	$20
Cow, two years old	Fredrika	Wm. Quinn	$10
Cow, one year old	Harvest Queen	Wm. Quinn	$10
Calf of 1873	Daisy	S. B. Emerson	$10
Bull, one year old	John Blacow	Chas. Clark	To be fixed
Herd of cattle.			
Best herd of cattle of any one breed, not less than six head, owned by one person	Ten entries	Carr & Chapman	$50

CASHMERE OR ANGORA GOATS.

Animal.	Name.	Exhibitor.	Premium.
Best thoroughbred buck, California raised	Prince	Lewis & McCracken.	$10
Thoroughbred ewe, California raised	Empress	Lewis & McCracken.	$10
Herd of ten graded goats		Lewis & McCracken.	$10

SHEEP.

Animal.	Name.	Exhibitor.	Premium.
Best Spanish merino ram	Big Leg	Severance & Peet	$10
Best Spanish merino ewe	Fanny	B. F. Watkins	$10
Pen of not less than five ewe lambs		B. F. Watkins	$10
French merino and Silesian.			
Best ram	Big Ben	Robt. Blacow	$10
Best ewe	Lucy	Robt. Blacow	$10
Three ram lambs	Tom, Dick, and Harry	Robt. Blacow	$10
Pen of not less than five ewe lambs		Robt. Blacow	$10
Cotswolds.			
Best ram	Pajaro	Lewis & McCracken.	Sp'l pre. rec.
Best ewe	Mollie	B. Bryant	$10
Pen of not less than five ewe lambs		Lewis & McCracken.	$10
Leicestershire.			
Best ram	Dick	Lewis & McCracken.	$10
Best ewe	Fan	Lewis & McCracken.	$10
Pen of not less than five ewe lambs		Lewis & McCracken.	$10
Sweepstakes.			
Best ram for all purposes	Gamester	Robt. Blacow	$20
Best ewe for all purposes	Beauty	Severance & Peet	$15

SWINE.

Animal.	Name.	Exhibitor.	Premium.
Best boar of any breed	Pete	John Q. Pearl	$10
Best sow of any breed	Sallie	Chas. Clark	$10
Best pair of pigs of any breed		E. A. Moorehouse	$5

Some of the articles exhibited deserve more than a passing mention. Among these are the following:

PLANTS AND FLOWERS.

Mr. John Rock exhibited a large and choice variety of plants and shrubs and cut flowers, among which were many rare specimens, which this gentleman has secured at great trouble and expense. Mr. O'Donnel also sustained his reputation as a florist, by a magnificent exhibition of flowers and flowering plants, but as he is one of the Trustees of the society, these were not entered for a premium. Dr. Saxe, of Santa Clara, also made up a fine floral display, while the cut flowers and ferns of Mr. Sanderson, and the large variety of dahlias exhibited by Mr. Fox, excited universal admiration.

SADDLERY AND HARNESS WORK.

The principal exhibitors in this line were Messrs. Messing and Stern, both of San José. The display of both these gentlemen was large, and the work perfect.

TANNED LEATHER.

The only exhibitor in this department was Mr. Eberhardt, of Santa Clara. He exhibited all descriptions of tanned leather, robes, etc. The work of this gentleman is so widely known throughout the State, and so universally admired, that a minute description is unnecessary.

DOMESTIC MANUFACTURES.

In this department, the San José Woolen Mills displayed a large number and variety of blankets, flannels, and cassimeres, many of which were also exhibited at the late State Fair. Mr. John Buckley, also of San José, displayed several pieces of home-made carpet from his looms in this city. Under this head might also be noticed the hermetically sealed goods of J. M. Dawson & Co., of the San José Fruit Cannery, an institution but lately started in this city, but now under most successful operation. Also, the exhibition of pottery from the works of Mr. Steiger, of this city; the horseshoes manufactured by Messrs. Murray & McQuade; the brass fittings, etc., from the San José Foundry; together with specimens of cocoons, silk thread, raw silk, etc., from the works of Mr. Higginbothan, also of this city.

NEEDLE AND FANCY WORK.

In this department the entries were numerous and varied. Among them were specially noticeable three pieces of elaborate tatting, a suit of child's clothes, and various articles of silk and cambric embroidery, crochet, worsted and chenille work, by Miss McChain; silk embroidery, by Mrs. Lineberg; embroidered carriage robe, by Mrs. Bray; a fancy toilet set in cambric embroidery, by Mrs. A. B. Post; and silk embroidery, by Mrs. R. G. Hamilton.

FARM AND GARDEN PRODUCTS.

The display in this department was much larger and in every way better, than at any previous exhibition. Among them were some half-dozen different entries of wheat, each specimen weighing about sixty-eight pounds to the bushel. Mr. Jesse Hobson showed some corn stalks fourteen feet high. Mr. A. Y. Easterly exhibited several specimens of Fresno County cotton. The different collections of vegetables were such as to excite the pride of our people here, both in variety and quality. A magnificent display of all kinds of vegetable seeds was made by Messrs. Scrivani, Capelli & Co.

BUTTER AND CHEESE.

In this line, the display was not so large as the society had reason to expect. Only two entries of cheese were made, and those by Messrs. Thomas Rea and Isaac Dixon. The exhibitors of butter were Mrs. C. W. Pomeroy, P. Reardan, Mrs. Watkins, Mrs. Armstrong, and Mrs. Lee. These ladies are the model housewives of our county, and each year the society is indebted to them for numerous entries of the products of their skill in the way of bread, butter, jellies, pickles, etc.

GRAPES AND WINE.

In this department, there were represented Mr. D. M. Harwood, of the Lone Hill Vineyard, Mr. Chas. Lefranc, of the Almaden Vineyard, and Mr. S. P. Stockton. The display, this year, was more with a view to quality than quantity, and the opinion of the society is, that the varieties of grapes on exhibition this season was far superior to that at any previous exhibition.

FRUITS AND NUTS.

All the displays in this department showed an improvement on those at previous exhibitions, and the society refers to the report of the Committee on Premiums for the statement of which is best. Here also was indicated a disposition not to run so much to quantity as to variety and quality. Some years ago, it was thought that fruit growing in this valley had about reached the ne plus ultra, but each succeeding year has seen a marked improvement in quality and variety, and our growers are but just at the threshold of their experiments. Among the many articles exhibited, we notice some quinces displayed by Mrs. Jos. Lee, each one of which measured eighteen inches minimum circumference, and whose average weight was two pounds four ounces each. It is, probably, well enough in this connection, to call attention to the display of sixteen varieties of dried fruit, by Mr. L. A. Gould, of Santa Clara. This is the same exhibit which was exposed at the late State Fair, and excited so much admiration.

MISCELLANEOUS.

The limits of this report will not allow the society to mention specially every entry to the pavilion, and we therefore refer your honorable Board, for detailed information, to the list of entries and award of premiums, merely saying that they were perfectly satisfactory to the society, as showing the progress of our county during the past year, in the different lines of industry which they represented.

THE STOCK YARDS.

The entries of stock were far more numerous than at any previous Fair; so much so, indeed, that it was with utmost difficulty that the society could prepare the additional stalls required by the demands of the exhibitors.

HORSES.

In this department the animals were of the finest quality, showing their blood prominently. Mr. John Hall, of Alameda County, exhibited his fine thoroughbred stallion, "Ironclad," and quite a number of other of his splendid thoroughbred mares and colts, all of which, for symmetry and action, give evidence of the knowledge and good judgment of Mr. Hall, and places him in the front rank of the breeders of first-class horses. Wm. Hamilton's stallion, "Ethan Allen, Jr.," with six of his colts, and W. A. Mathews' stallion, "Geo. M. Patchen, Jr.," with a family of six colts, were probably the most interesting feature of this branch of the exhibition. In the line of "horses for all purposes," there were twenty-one entries (among them Wm. A. Mathews' celebrated stalllion, "Geo. M. Patchen, Jr."), showing the interest which is growing in this department of stock raising.

DURHAM CATTLE.

In this department the contest for the society's premium was specially spirited, there being nine entries of bulls and twenty-three of cows and heifers. A reference to the lists will give the names of the principal competitors and the successful exhibitors.

ALDERNEYS.

Four entries of bulls were made in this department, and of cows two, the latter being by C. B. Polhemus. The people of this locality have a penchant for Durhams, and Alderneys are but little bred.

ANGORA GOATS.

The only entries in this department were by Messrs. Lewis & McCracken. Their herd is very choice, and the gentlemen themselves enthusiasts in this line. They are constantly adding to and improving their herd and are doing their utmost to render the breeding of Angoras general in this county. They also had the only herd of Cotswold sheep on exhibition.

MERINOS.

Messrs. B. F. Watkins, of Santa Clara, and Robert Blacow, were the only exhibitors of merinos. The department, however, was well represented, both in number and quality, and would compare favorably with such a display anywhere in the State. In fact, the exhibition of stock in all its departments was exceedingly gratifying to the society, showing, as it did, not only a present excellence, but a steady improvement and growing interest ever since the first public exhibition was made under the auspices of our organization.

VARIOUS MATTERS.

Since our last annual report, the society has spent much time and money in beautifying and improving their grounds on the Alameda, and in time hope to make them the most convenient and attractive of any in the State. Not having the funds with which to erect new buildings, their efforts have been directed to repairing and renovating the old ones, and laying out and decorating the grounds of the Park. Hitherto they have had to depend on rented apartments in the city for opportunities to display their Pavilion articles. This has entailed a large expense annually, but the society hope, with due economy and proper management, soon to own its Pavilion. Heretofore there has been considerable prejudice existing in the minds of many of the people against what they termed "agricultural horse races," and this prejudice has had its effect on the initiatory steps of the society, previous to every annual exhibition. At the late Fair, however, the vast multitudes which attended the daily trials of speed, proved that this feeling was only a prejudice and was fast wearing out. The society hopes that at their next exhibition it will have the hearty coöperation of all classes of people in the work of productive improvement to which it is devoted.

Respectfully submitted.

D. J. PORTER,
Secretary S. C. V. A. Society.

TRANSACTIONS

OF

The San Joaquin Valley Agricultural Society

FOR

THE YEAR 1873.

OFFICERS OF THE SOCIETY.

PRESIDENT.

CALEB DORSEY.. Stanislaus County.

FIRST VICE PRESIDENT.

J. R. W. HITCHCOCK...San Joaquin County.

SECOND VICE PRESIDENT.

JOHN H. O'BRIEN..Stockton.

SECRETARY.

H. T. COMPTON..Stockton.

TREASURER.

F. S. HINDS..Stockton.

DIRECTORS.

C. E. NEEDHAM..San Joaquin County.
ROBERT McHENRY...San Joaquin County.

REPORT.

To the honorable the State Board of Agriculture of the State of California:

Gentlemen: The Board of Managers of the San Joaquin Valley Agricultural Society, as required by law, respectfully submit the annexed report of the transactions of the society for the year eighteen hundred and seventy-three, including a list of the articles exhibited and premiums awarded, the amount of receipts and expenditures for the year, and the objects for which such expenditures have been made. In regard to "new industries inaugurated and new products produced," they have nothing to report in addition to those referred to in their report for the last year.

It will be seen, by reference to the financial statement hereto annexed, that the receipts exceed the expenditure in the sum of one hundred and ninety-seven dollars and seventeen cents.

It is gratifying to report that the Fair, on the whole, was a decided success, as regards the entire satisfaction and pleasure it afforded to visitors, as well as exhibitors. On no former occasion has greater interest been manifested. The exhibition of improved stock at the Fair grounds has never heretofore been equaled. Too much cannot be said in compliment to the ladies, for the spirit manifested by them in bringing forward the products of their own fair hands, for generous and friendly competition, the display of which rendered the Hall a place of beauty and attraction. The managers take this opportunity of tendering their thanks to Mr. Winslow, Mr. Ladd, and others, for valuable and efficient services kindly rendered by them gratuitously during the time of the Fair, and to those citizens who so generously assisted in the decoration of the Hall, by the loan of pictures, flags, and other articles.

Respectfully submitted.

CALEB DORSEY, President.

H. T. Compton, Secretary.

Stockton, December 1st, 1873.

FINANCIAL.

Total receipts for 1873		$9,715 53
Disbursements.		
Amount premiums paid	$1,688 23	
Amount purses to races	2,750 00	
Amount paid premiums 1872, and current expenses of 1873	5,080 13	
Amount cash on hand	197 17	
	$9,715 53	$9,715 53

The notes of society negotiated at Bank of Stockton and entered in the receipts, amounting, with interest, to six hundred and forty-four dollars and thirty-two cents, was paid by an appropriation made by the Board of Supervisors of San Joaquin County.

PREMIUMS AWARDED.

FIRST DEPARTMENT—LIVE STOCK.

CLASS I.—CATTLE.

Animal.	Name.	Exhibitor.	Premium.
Durhams.			
Best bull, three years old and upward (none on exhibition for competition)	Monkey John	W. L. Overhiser	Spec. notice.
Best bull, two years old and upwards	Fourth Turk of Oakhome	W. L. Overhiser	$10
Second best bull, one year old	Fourth Duke of Yuba	L. U. Shippee	$5
Best calf	Grand Turk of Oakhome	W. L. Overhiser	Framed Dip.
Best bull	Paragon	E. S. Holden	Spec'l prem.
Best cow, three years old and upwards	Rosette Second	W. L. Overhiser	$15
Best cow, two years old and upwards	Flora Temple 6th.	W. L. Overhiser	$10
Best heifer, one year old and upwards	Snowdrop	E. S. Holden	$5
Best bull, four years old	Jesse	L. U. Shippee	Spec'l notice.
Best bull, two years old	Starlight	L. U. Shippee	Spec'l notice.
Graded Cattle.			
Best cow, three years old and upwards	Dolly Varden	M. Neff	$5
Herds.			
For exhibit of a splendid herd of graded cattle, scarcely to be distinguished, by the best judges, from thoroughbreds		Charles Clark	Spec'l prem.
Best of thoroughbred Durhams in the district		W. L. Overhiser	$15
Sweepstakes.			
Best thoroughbred bull	Dandy Jim	Vernon & Flirt	$15
Best thoroughbred cow	Sprightly	Colonel Younger	$10
Best milch cow	Flora Temple 4th.	W. L. Overhiser	$10

CLASS II—THOROUGHBRED HORSES.

Animal.	Name.	Exhibitor.	Premium.
Best stallion, four years old and upwards	Specter	Dorsey & Ewing	$30
Best stallion, two years old and upwards	Firetail	N. W. Randall	$15
Best stallion, one year old and upwards	Morphene	James Satterlee	$10
Best mare, four years old and upwards	Carrie Miller	N. W. Randall	$25
Second best mare	Farmer's Maid	D. Potter	Fr. diploma.
Best mare, three years old and upwards	Susie Shepherd	Charles Blood	$20
Best mare, two years old and upwards	Dolly Varden	Andrew Wolf	$15
Best sucking colt	Eva	James Satterlee	$5

[As Chairman of the committee, I will say that the exhibition in this class, as a whole, was one that does honor to the owners of the stock so exhibited.

J. B. HINKLE.]

CLASS III—ROADSTERS.

Animal.	Name.	Exhibitor.	Premium.
Best stallion, three years old and upwards	Captain Moss	J. R. W. Hitchcock	$20
Second best stallion	Morgan Rattler	W. E. Morris	Fr. diploma.
Best three-year-old and upwards	Grattan's Black-hawk	Dr. C. Grattan	$25
Second best three-year-old	Punch	Charles Braid	Fr. diploma.
Best two-year-old and upwards	Barney Horn	Charles Sisson	$10
Second best two-year-old and upwards	Lycurgus	J. R. W. Hitchcock	Fr. diploma.
Best one-year-old and upwards	Captain Lewis	Andrew Wolf	$5
Second best one-year-old and upwards	General	William Murray	Fr. diploma.
Best sucking colt	Little Mack	Andrew Wolf	$5
Second best sucking colt	Soldier Boy	R. S. Johnson	Fr. diploma.
Best mare, four years old and upwards	Jennie Lind	C. E. Needham	$20
Second best mare, four years old and upwards	Black Bess	Andrew Wolf	Fr. diploma.
Best three-year-old and upwards	Mandie	C. A. McCloud	$15
Second best three-year-old and upwards	Blonde	J. A. McCloud	Fr. diploma.
Best two-year-old and upwards	Flora Hill	C. E. Needham	$10
Second best two-year-old and upwards	Kate Kelly	Charles Sisson	Fr. diploma.
Best one-year-old and upwards	Nellie Manning	F. S. Hinds	$5
Second best one-year-old	Pet	J. A. McCloud	Fr. diploma.
Best sucking colt	Lady Sisson	Andrew Wolf	$5
Second best sucking colt	Gazelle	F. S. Hinds	Fr. diploma.

CLASS V.

Animal.	Name.	Exhibitor.	Premium.
Best stallion for all purposes	John Miller	Beardsley & Fee	$20
Best mare for all purposes	Nellie Brown	William Murray	$15
Best span of roadsters	Capitola and Mate.	J. A. McCloud	$10
Best span of carriage horses	Sam and Nell	William Miller	$10
Best saddle horse	Pete	William Miller	$5
Sweepstakes.			
Best stallion	Carr's Membrino	Jesse D. Carr	$10
Best mare	Lady Dale	Andrew Wolf	$10

CLASS VI.

Animal.	Name.	Exhibitor.	Premium.
Best span of mules		W. L. Overhiser	$10

CLASS VII—SHEEP.

Animal.	Name.	Exhibitor.	Premium.
Spanish Merino.			
Best ram, two years old and over.	Golden Fleece	C. C. Baker	$10
Best ram, one year old and under two	Colonel Ellsworth.	L. U. Shippee	$10
Best three ram lambs		C. C. Baker	$5
Best pen of seven ewes, two years old and over		L. U. Shippee	$10
Best pen of seven ewes, one year old and under		L. U. Shippee	$10
Best pen of five ewe lambs		C. C. Baker	$5
Best ram and five of his lambs	Golden Fleece and five lambs	C. C. Baker	$15
One two-year-old ewe and one ram lamb		J. Sarles	Special premium rec.
Southdowns.			
Best ram, two years old and over.	Tom	Shippee & Ashley	$10
Best ram, one year old and under two	John	Shippee & Ashley	$10
Best three ram lambs		Shippee & Ashley	$5
Best pen of five ewes, two years old and over		Shippee & Ashley	$10
Best pen of five ewes, one year old and under two		Shippee & Ashley	$5
Best pen of five ewe lambs		Shippee & Ashley	$5
Best ram aud five of his lambs	Tom	Shippee & Ashley	$15

CLASS VII—SHEEP—Continued.

Animal.	Name.	Exhibitor.	Premium.
Cotswolds, graded.			
Best ram, two years old and over.	Stockton	Shippee & Ashley	$5
Best pen of ewes, two years old and over		L. U. Shippee	$5
Merino, graded.			
Best pen of ewes, two years old and over		W. D. Ashley	$5
Five ram lambs, graded with Spanish merino		J. Sarles	Special premium rec.
Sweepstakes.			
Best buck	Colonel Ellsworth.	L. U. Shippee	$10
Best ewe		C. C. Baker	$5

CLASS VIII—GOATS.

Animal.	Name.	Exhibitor.	Premium.
Best Cashmere buck	Toby	Landrum & Rogers	$10
Best ewe	Nellie	Landrum & Rogers	$5

CLASS IX—SWINE.

Animal.	Exhibitor.	Premium.
Best Suffolk sow and four pigs	William M. Baggs	$5
Best sow	William M. Baggs	$3
Best boar (Emperor)	Andrew Wolf	$3
Best sow (Empress)	Andrew Wolf	$3
Best sow and pigs (Empress)	A. Wolf	$5
Ten thoroughbred Berkshire pigs	R. M. Sparks	Special prem. rec.
Sweepstakes.		
Best Berkshire boar	R. M. Sparks	$5
Best Berkshire sow	R. M. Sparks	$5

CLASS X—POULTRY.

Animal.	Exhibitor.	Premium.
Best Polands of any color	John E. Moore	$5
Best silver Polands	A. G. Brown	$5
Best half Polands	P. T. Brown	$5
Best Dominique fowls	J. C. Gage	$5
Best white Cochins	A. G. Brown	$5
Best dark Bramahs	E. B. Smith	$5
Best light Bramahs	W. H. Groves	$5
Good exhibit of light Bramahs	W. H. Van Vlear	Spec. prem. rec.
Good exhibit of light Bramahs	Dr. E. S. Holden	Spec. prem. rec.
Best Partridge Cochins	William M. Hickman	$5
Best buff Cochins	A. G. Brown	$5
Best white Leghorns	Mrs. R. S. Bates	$5
Black Polands, with silver topknots	Frank West	Spec. prem. rec.
Best exhibit of mixed Polands	P. T. Brown	Spec. prem. rec.
Best Houdans	P. T. Brown	$5
Two coops of Bantams	W. H. Van Vlear	Rec. fav. men.
Best silver Hamburgs	P. T. Brown	$6
Best bronze turkeys	E. S. Holden	$3
Best exhibit of rabbits	William M. Baggs	Prem. awarded.
Greatest variety of rabbits	Willie F. Holden	Prem. awarded.

SECOND DEPARTMENT.

CLASS I.

Article.	Exhibitor.	Premium.
Best sample hops	James Putnam	$10
Sample of Canada oats, one bushel This exhibit was the product of one quart of seed sent from the National Department of Agriculture, for the purpose of experiment, and was sown by Mr. T. J. Murray, the gardener, on the asylum grounds.	Insane Asylum	$5

CLASS II—VEGETABLES.

Article.	Exhibitor.	Premium.
Messrs. Hale & Co. make a very fine display of market vegetables, not entered for competition		
The Insane Asylum makes a very fine display, considering the lateness of the season. This is the only collection of vegetables raised on one place, and Mr. T. J. Murray, the gardener, is entitled to the thanks of the society for his exhibit		
Mr. James Putnam exhibits three watermelons of mammoth size, the largest and finest probably ever shown in Stockton		
Mr. Gio Gassolo exhibits a sample of onions, but not of such quality as to merit a premium		

CLASS III—WINES, ETC.

Article.	Exhibitor.	Premium.
Best White wine, vintage of 1870	George West	$5
Best White wine, vintage of 1871	C. Detton	$5
Best White wine, vintage of 1872	C. Detton	$5
Best Port wine, vintage of 1870	George West	$5
Best Port wine, vintage of 1871	George West	$5
Best Port wine, vintage of 1872	George West	$5
Best Angelica wine, vintage of 1871	George West	$5
Best Angelica wine, vintage of 1872	George West	$5
Best Madeira wine, vintage of 1869	George West	$5
Best Sherry wine, vintage of 1867	George West	$5
The Sherry is the best wine we have tasted in California of native wines.		
Best Red wine, vintage of 1871	George West	$5
Best Red wine, vintage of 1872	George West	$5
Best grape brandy, vintage of 1870	George West	$5
Best grape brandy, vintage of 1871	George West	$5
Best grape brandy, vintage of 1872	George West	$5

CLASS IV—APPLES.

Article.	Exhibitor.	Premium.
Best collection of apples in this district	Joseph Putnam	$15
Second best collection of apples	James A. Goodwin	$10
Best five varieties	Peter N. Young	$5
Pears.		
Best collection of pears	George West	$10
Second best collection of pears	P. N. Young	$5
Best five varieties of pears	Joseph Putnam	$3
Best three varieties of pears	George West	$2

FRUIT.

Article.	Exhibitor.	Premium.
Nectarines.		
Best six specimens nectarines	James A. Goodwin	$2
Peaches.		
Best peaches	James A. Goodwin	$5
Quinces.		
Best twelve specimens quinces	P. N. Young	$3
Second best quinces	Uriah Martin	$2
Figs.		
Best figs	P. N. Young	$4
Pomegranates.		
Best six specimens pomegranates	Dr. R. K. Reid	$3
Grapes.		
Best collection	James A. Goodwin	$15
Second best collection	Geo. West	$10
Third best collection	P. N. Young	$5
Best five varieties	Jos. Putnam	$5
Second best five varieties	D. A. Learned	$3
Best single variety	J. A. Goodwin	$2
Dried fruit.		
Best dried apples	W. D. Ashley	$3
Best dried figs	Eddie Sedgwick	$5
Second best dried figs	P. N. Young	$2
Best raisins	Uriah Martin	$5

FRUIT—Continued.

Article.	Exhibitor.	Premium.
Preserved fruit.		
Best and largest variety preserves in spirits	Mrs. Jos. Hale	$5
Best plums	Mrs. Jos. Hale	$2
Best cherries	Mrs. Jos. Hale	$2
Best strawberries	Mrs. Jos. Hale	$2
Best Hungarian plums	Mrs. W. H. Lyons	
Green gages in spirits	Mrs. Reid	Special premium.
Best grapes in spirits	Mrs. R. S. Bates	Special premium.
Best pears in spirits	Mrs. R. S. Bates	Special premium.
Best peaches in spirits	Mrs. R. S. Bates	Special premium.
Best and largest variety of preserved fruits and jellies	Mrs. Jos. Hale	$45
Second best	Mrs. R. S. Bates	$5
Best quinces preserved in sugar	Mrs. Hale	$3
Best apricots preserved in sugar	Mrs. Hale	$3
Best grapes preserved in sugar	Mrs. Hale	$3
Best plums preserved in sugar	Mrs. Reid	$3
Best crab apples preserved in sugar	Mrs. Reid	$3
Best pears preserved in sugar	Mrs. Reid	$3
Best peaches preserved in sugar	Mrs. Bates	$3
Jellies.		
Best apricot jelly	Mrs. Jos. Hale	$3
Best grape jelly	Mrs. Jos. Hale	$3
Best quince jelly	Mrs. Jos. Hale	$3
Best crab apple jelly	Mrs. Jos. Hale	$3
Best plum jelly	Mrs. Bates	$3
Best currant jelly	Mrs. Reid	$3
Best blackberry jelly	Mrs. Reid	$3
Pickles.		
Best mixed pickles	Mrs. Hale	$3
Best gerkins pickles	Mrs. Hale	$3
Best cucumber pickles	Mrs. Hale	$3
Best tomato pickles	Mrs. Hale	$3
Best fig pickles	Mrs. Hale	$3
Best pear pickles	Mrs. Reid	$3
Best peach pickles	Mrs. Reid	$3

CLASS V.

Article.	Exhibitor.	Premium.
Best collection of cut flowers	W. B. West	$5
Best bouquet of live flowers		$5

CLASS VI.

Article.	Exhibitor.	Premium.
Best two loaves white bread	Mrs. J. C. Reid	$3
Best brown bread	Mrs. Joseph Hale	$3
Second best two loaves bread, by misses under sixteen years old	Miss Pauline Deidrick	$3
Best bakers' bread and crackers	Charles Garrow	Framed diploma.

CLASS VII.

Article.	Exhibitor.	Premium.
Best machine silk and twist	Brown & Peabody	
Remarks of committee: "We find a fine assortment of machine silk in quarter ounce, one ounce, and half ounce spools; also, button-hole twist, in all the new shades and numbers. They also display a fine assortment of the raw material, which is worthy of notice."		

THIRD DEPARTMENT.

CLASS I—AGRICULTURAL IMPLEMENTS.

Article.	Exhibitor.	Premium.
Best display agricultural implements	Matteson & Williamson.	$15
Best header	Matteson & Williamson.	$20
Best sulky gang plow	Matteson & Williamson.	$10
Best harrow	R. M. Grewell	$3
Best large cultivator	Matteson & Williamson.	$10
Best horse fork	Matteson & Williamson.	$10
The above articles were all manufactured in the district.		
Burdick hay cutter	M. C. Hawley & Co.	Special prem. recom'd.
Messrs. Jones & Hewlett, L. M. Cutting & Co., and M. C. Hawley & Co., each make a fine exhibit of agricultural implements, of Eastern as well as California manufacture, with all the modern improvements, which reflects credit upon them as enterprising business men, fully prepared to meet the wants of the farming community.		
Churn	L. M. Cutting & Co.	Special prem. recom'd.

CLASS II—WHEELWRIGHT WORK.

Article.	Exhibitor.	Premium.
Best display of carriages	Henderson & Clark	$10
Best two-horse carriage	Henderson & Clark	$5
Best buggy	Henderson & Clark	$5
Best two-horse wagon	W. P. Miller	$5
Jones & Hewlett exhibit one California made wagon and two Bains' thimble skein wagons. For a light, durable, and cheap wagon, the committee consider them inferior to none.		

CLASS III—HARNESS AND LEATHER.

Article.	Exhibitor.	Premium.
Best display of leather manufactured in the district	Kullman & Wagner	$8
Best side sole leather	Kullman & Wagner	$8
Best side harness leather	Kullman & Wagner	$8
Best side upper leather	Kullman & Wagner	$8
Best half dozen calf skins	Kullman & Wagner	Framed diploma.
Two collars	J. A. Andrews	Framed diploma.

CLASS IV—MACHINERY AND BLACKSMITH WORK.

Article.	Exhibitor.	Premium.
Best portable forge—blower attached	Globe Iron Works	$5
Best force pump	Globe Iron Works	$5
Best wooden pump	A. M. Jewell & Co	Special premium rec.
Samples of fluting irons	Weister & Co	Special mention.
Exhibit of springs	Betts' Spring Co	Special premium.
Best display of horseshoes	John Burns	$5

CLASS VI—MUSICAL INSTRUMENTS.

Article.	Exhibitor.	Premium.
One Haines piano and one Burdett organ, the only instruments on exhibition	William Kierski	Special notice.

CLASS VI—FURNITURE.

Article.	Exhibitor.	Premium.
Best display of parlor furniture	Netz & Heinze	$5
Best display of upholstery	Netz & Heinze	$5
Best center table	Netz & Heinze	$5
Best lounge	Netz & Heinze	$3
Best display of mattresses	Netz & Heinze	$3
Display of mattresses	A. T. Sherwood & Co	Special premium.
Folding cot	A. T. Sherwood & Co	Honorable mention.
Old style spring mattress	Netz & Heinze	Honorable mention.

CLASS VII—ROPE.

Article.	Exhibitor.	Premium.
Exhibit of complete assortment of superior quality of rope	Tubbs & Co	Special premium.

CLASS VII—FIREARMS.

Article.	Exhibitor.	Premium.
Best display of firearms	W. H. Van Vlear	$5

CLASS VIII—CHILDREN'S CLOTHING, SEWING, ETC.

Article.	Exhibitor.	Premium.
Best home-made rug	Mrs. Joseph Hale	$3
Best patchwork quilt	Mrs. H. M. Fanning	$3
Best hand-made shirt	Mrs. J. C. Gage	Silver fruit basket—$10
Second best hand-made shirt	Mrs. Elizabeth McKee	$3

CLASS VIII—EMBROIDERY.

Article.	Exhibitor.	Premium.
Best embroidery	Mrs. S. D. Waterman	$3
Best sofa cushion	Miss Hannah Corcoran	$3
Best embroidered dress	Mrs L. M. Fairbanks	$3
Best display of needle and fancy work	Mrs. Franklin Robinson	Silver tea pitcher—$15

CLASS VII.

Article.	Exhibitor.	Premium.
Best display of tinware	L. M. Hickman	Framed diploma.
Best display of stoves	L. M. Hickman	$5
C. G. Ernest has also made a fine display of copper ware, for stove trimmings, of superior quality, for which no premium has been offered. The committee recommend a special premium.		

CLASS VIII.

Article.	Exhibitor.	Premium.
Best display of knitting.	Mrs. Charles Carner	$5
Crochet work	Miss Amelia Nash	$5
Worsted tidy	Mrs. Frank Stewart	Special premium rec.
Best waxwork	Miss Clara Fanning	$5
Largest and best variety of wax flowers.	Mrs. J. P. Fogg	$5
Best specimen of sea mosses	Miss Mary Allen	$3
Best feather flowers	Mrs. A. F. Weber	$5
Best preserved natural flowers	Miss A. A. Corey	$5
Best cone work	Miss Louise Dacklin	$3
Best dried flowers	Mrs. Joseph Hale	$3
Best artificial flowers	Miss Matilda E. Ruddick	$3
Best bead work	Mrs. F. Robinson	$3
Best silk embroidery	Miss Mary Allen	$3
Best tapestry work	Miss Louisa M. Garry	$3
Best embroidered handkerchief	Mrs. Wm. M. Hickman	$3
Best ottoman cover (worsted embroidered)	Mrs. James Tatterson	$5

CLASS VIII—MISSES WORK.

Article.	Exhibitor.	Premium.
Best four pieces of hand sewing by miss under twenty years of age	Miss Maud Inglis, age thirteen years	$5
Best patchwork quilt	Miss Maud Inglis	$2
Best specimen of stocking darning	Miss Bertie Brush	$2

CLASS X.

Article.	Exhibitor.	Premium.
Best essay, "How to Make a Small Farm Pay"	George S. Harkness, Jr.	$5
Best phantom leaf work	Mrs. F. Robinson	$5

CLASS VIII.

Article.	Exhibitor.	Premium.
Best specimen of shell work	Mrs. W. H. Tredway	$3
Best preserved natural grasses	Mrs. Jos. Hale	$3
Best specimen hair work	Mrs. Austin Sperry	$3

FOURTH DEPARTMENT.

(FOR THE ENCOURAGEMENT OF THE YOUNG PEOPLE.)

Article.	Exhibitor.	Premium.
Best animal drawing (crayon)	Miss Virginia Lyons	$5
Best landscape drawing (crayon)	Miss Louisa Trahern	$5
Best animal drawing (pencil)	Master Oxley Miller	$3
Best landscape drawing (pencil)	Master B. Armington	$3
Best specimen mechanical ingenuity	Master Wm. Alisky	$2

ENTERED BY PUPILS OF PUBLIC SCHOOLS.

Article.	Exhibitor.	Premium.
Best animal drawing (crayon)	Miss Virginia Lyons	$5
Best animal drawing (pencil)	Master Oxley Miller	$5
Best landscape drawing, in pencil	Master Oxley Miller	$5
Best composition	Miss Mary Langworthy	$5
Best map of California	H. T. Compton, Jr.	$5
Best map drawing	Miss Hattie Haas	$5
Best penmanship	Master W. W. Westbay	$5

CLASS II.

Article.	Exhibitor.	Premium.
Best collection of marble work	E. R. Roberts	$10
Best marble mantel	E. R. Roberts	$5

FIFTH DEPARTMENT.

CLASS I.

Article.	Exhibitor.	Premium.
Best exhibition of photographs	J. Pitcher Spooner	$5
Best landscape drawing in water colors.	Mrs. G. S. Allard	$5
Best specimen of fruit painting in oil	Mrs. G. S. Allard	$3
Best crayon	Miss Mary Allen	$3
Best oil painting	Mrs. Amelia Amyx	$5
Best animal painting	Mrs. Nash	$5
Best painting on glass	Miss Westbay	Diploma.
Best exhibit of painting in oil	Mrs. Dr. I. S. Titus	$10
"Struggle for Life," a painting in water color	Miss Allen	
The committee deem it of the highest order, but find that it is not enumerated among those entitled to premiums.		

SPECIAL PREMIUMS.

This class includes such articles as were excluded from competition by reason of being manufactured or produced without this district; also, those articles for which no premium was offered in the list or schedule of premiums. For justice to these exhibitors the Board of Managers deem it proper to make the following notices or awards:

Article.	Exhibitor.	Premium.
Exhibit of paper	Pacific Paper Mills	Framed diploma.
Exhibit of hair work, such as curls, switches, braids, etc	Joseph Couturier	Framed diploma.
Exhibit of a charm string of one thousand buttons	Miss Josephine Myers	Special mention.
Exhibit of a fine collection of silk cocoons and floss silk, from Calaveras County	B. R. Prince	Framed diploma.
Exhibit of Home sewing machines	E. M. Haines, agent	Framed diploma.
Exhibit of a large assortment of proprietary medicines and chemicals	Dr. E. S. Holden	Special notice.
Exhibit of samples of different grades of sugar from Capitol Sugar Refinery, Sacramento	Chas. Dohrmann, agent.	Framed diploma.
Exhibit of gentlemen's furnishing goods	P. Beamish & Co	Framed diploma.
Exhibit of burial case	M. H. Bond	
Exhibit of ladies' merino robes, gentlemen's burial suits, children's robes, and other articles suitable and necessary for funeral purposes	Mrs. M. H. Bond	Framed diploma.
Superior specimens of printing	D. H. Berdine, Stock'n.	Framed diploma.
Model of a fruit drier	W. B. West	Special notice.
Uniform (drum major's)	John Kafitz	Framed diploma.
Preserved wooden rails	The Wood Preserving Co., San Francisco	Special notice.
Samples of spring bed bottoms	C. V. B. Reeder, Sacramento	Framed diploma.
Grain separator	Messrs. Nash, Miller & Co., Sacramento	Framed diploma.
McNeale & Urbant's safes (Cincinnati)	Rhodes & Irvine	Framed diploma.
Perkins' self-regulating windmill	Horton & Kennedy, Livermore, Cal	Framed diploma.
For Dexter mill	A. H. Southworth & Co., San Francisco	Honorable mention.
Clocks and jewelry	Charles Hass	Framed diploma.

COMMITTEE REPORTS.

STOCKTON, September 25th, 1873.

To the Executive Committee of San Joaquin Valley Agricultural Society:

GENTLEMEN: We, your committee appointed to judge on articles comprised in Class No. 7, in the Rope Department, respectfully report that they have examined all that they find on exhibition therein, and award premium as follows:

For best exhibit, made by R. B. Parker & Co., for Tubbs & Co. (San

Francisco Cordage Company), your committee appointed as judges upon rope would recommend a special premium and framed diploma, as the samples on exhibition are very superior and deserving of special notice.

The two large coils of cable exhibited were not manufactured expressly for exhibition, but to fill an order in the interior, and will be forwarded to their destination to-morrow. Too much cannot be said in praise of the samples on exhibition, numbering fifteen coils, varying in size from the smallest sized baling rope to the heavy hoisting cables.

Respectfully submitted.

L. M. CUTTING,
AUSTIN SPERRY,
A. W. SIMPSON,
H. S. SARGENT,
Committee.

STOCKTON, September 25th, 1873.

To the Executive Committee of San Joaquin Valley Agricultural Society:

GENTLEMEN: We, your committee appointed to judge on articles comprised in Class No. ——, in the Paper Department, respectfully report that they have examined all that they find on exhibition therein, and award premium as follows:

For best display of paper, to Pacific Paper Mill. We find three classes of paper, news, Manilla, and wrapping, all of good quality, made from straw. This is a new home industry, and its work is highly creditable, and promises grand results. We would recommend a framed diploma.

Respectfully submitted.

W. BIVEN,
CHARLES HAAS,
A. C. BERITZHOFF,
Committee.

ANNUAL ADDRESS.

DELIVERED BY J. H. BUDD, ESQ., OF STOCKTON.

MR. PRESIDENT, LADIES AND GENTLEMEN: The thirteenth annual exhibition of the society will soon be closed. The eye has been pleased and the fancy has been delighted by the many and varied productions of the soil presented to the admiring gaze, while the skilled artisan has elicited praise by the ingenuity and practical utility of his works. The symmetrical forms of improved breeds of domestic animals have graced the Fair grounds, and the swiftness and beauty of the trained steed has lent an interest to the racecourse. This exhibition has been a source of pleasure to all, of information to many, and of profit to some. But, while conceding the utility of organizations like this in an agricultural community, would it not be well to consider whether their usefulness might not be greatly increased by requiring the exhibitors to furnish with the articles exhibited some information respecting the means of their production? We wish to know not alone the results, but the means also by which such results are accomplished. A farmer raises fifty bushels of wheat to the acre; it is important to know that such a result can be accomplished, but it is of far greater importance to know the methods of its accomplishment. One farmer raises thirty bushels of grain to the acre, and another, on land equally as fertile, does not raise one third of that amount. We wish to know the reason of this difference. In other words, it is important that the community should learn the best methods of cultivating the soil of this valley. The proper method of cultivating the soil in Europe, or in the Eastern States, may not be the proper method of cultivation here. Our soil and our climate differ from the soil and climate of those countries, and the knowledge of the right method of farming there will aid the husbandman but little here. We need information respecting the proper method of cultivating the soil of this valley, and that can alone be obtained through the observation and experience of the farmers of this valley. This society should not only give premiums for articles exhibited, but should also award premiums to those who give information of their method of cultivating the soil and of the results of such cultivation; and the practical information thus obtained, if properly collected, classified, and published, would more benefit the farmers of this part of the State than would the institution of any number of so-called agricultural colleges. The farmer, in this way, could acquire knowledge of the information acquired through the observation and experience of other farmers of the valley, and by comparing this with the results of his own observation and experience, he could not fail to improve in his own method of cultivating the soil.

Not only should the farmer write out for the benefit of others, to be classified and published by societies like this, his experience in the raising of crops, but the soil of the different localities in the valley should be carefully analyzed, and such analysis should be published, so that the farmer of every locality could know in what the soil he cultivates is lacking, and how to supply the needed element to make it grain producing. This State has expended large sums of money for the geological survey of the State, and this money has been well expended, and no one complains. But from this survey the farmers have learned nothing to their benefit. The farmer is less interested in the different ages and strata of the rocks of the mountain ranges than in a knowledge of the constituent elements of the soil, which supplies the needed nutriment for the growth of his grain. He is less interested in knowing whether the glacial or some other theory be the correct one in respect to changes which were made, in ages long gone by, on the surface of the earth, than he is in the knowledge of the correct mode of cultivating that portion of the earth's surface which he now lives on. It matters, practically, little to him whether an open sea or a thick and impenetrable field of ice surrounds the North Pole; but it is of the first importance for him to know whether the soil of this valley is usually too arid or too moist for the growth of his crops, and if too arid, whether the needed moisture can be supplied by artificial means.

Time, money, health, even life itself, have been lavishly expended in extending the bounds of knowledge within the limits of the frozen north, and in exploring the infectuous districts of the torrid zone. Science, aided by State and national bounty, has sent forth her many votaries to explore the hidden recesses of the mountain fastnesses, and to listen to the voice of the firm-seated rocks as they speak of past ages of the world. But the present of time and place, the here of locality, and the now of existence, are ignored by science as unworthy of her notice, and are practically unnoticed by Government in the bestowal of her bounty. What scientist has been aided by the State to analyze and make known the constituent elements of the soil of our cultivated valleys? What scientist has, of his own motion, and to extend the bounds of practical and useful knowledge, made such analysis? What information have the votaries of science given us respecting fertilizers to be used to improve the quality of the soil? What appropriation has Government made to collect practical information respecting the cultivation of these valleys and the results of the different modes of culture? And what, finally, have our agricultural societies done to obtain and disseminate practical and useful information respecting the best methods of cultivating the soil, and a knowledge of its constituent elements?

What premium of plate has been offered by State or district societies for information respecting a mode of cultivation and irrigation which would insure as large crops as have ever heretofore been produced in this State? What purses have been offered to competing farmers for large yields of grain, and for a knowledge of the methods by which they were produced? Yet, it is a thousand, yea, a millionfold more important to the State that farmers should know how to insure a certain growth of crops equal to that ever produced in the State, than it was to know that Governor Stanford's horse Occident could equal the fastest time made by Goldsmith Maid, or to know that Thad. Stevens, Nell Flaherty, or Thornhill, could pass over a mile of track as rapidly as the famous racing steeds of the Eastern States! We had an Agricultural College richly endowed by Congress, and liberally aided by the State, but what provision has been made by State or National Government for the obtaining of practical, useful, needed information respecting agriculture to be taught in this college? Learned professors have been employed to give our youth information respecting agriculture, but these professors are profoundly ignorant of everything connected with agricultural pursuits. We might as well apprentice our sons with the cabinet maker to learn the art of printing, or with a grocer to learn the craft of a machinist, as to send them to our Agricultural College to learn aught useful respecting husbandry. The fault is not with the professors; they are learned, diligent, and anxious to give useful and practical information to the student. But the State has made no provision for collecting information concerning the soil, and the proper mode of its culture, to be classified by these professors and taught to our young men.

Why has not provision been made for the analysis of the soil, of the grain-growing valleys, and of the different kinds of fertilizers? Why have not appropriations been made to test the different methods of irrigation, and to determine from actual experiments the amount of water which the soil should contain during the growth of crops? Why has not some effort been made to induce our practical farmers to write out their method of cultivating the soil, and its results? Were this done, the professors in our Agricultural College could classify the information thus obtained, and arrive at a knowledge of the best system of farming in this State, and could instruct their students in the knowledge of such a system. We have a Military Academy at West Point, and the young men designed for the army receive practical information respecting the science of war. Experiments are made with different kinds of ordinances, with projectiles, and in respect to the explosive power of gunpowder. Government, by the experiments which it authorizes to be made, so by the investigations which it institutes in respect to all matters connected with the art of war, has extended the bounds of military knowledge, and enables the professors of its Military Academy to give the cadets useful, practical knowledge respecting their chosen profession. We have a Naval Academy at Annapolis. The Government not only employs instructors for its naval students but provides means for the acquiring of information in respect to naval matters to be imparted to these young men. Observatories have been established by the Government at different points to obtain information in respect to air currents, their force and direction, and in respect to wind and rain storms, their rate of travel, direction, and extent, and in respect to the electricity in the air, and, from the information thus obtained, knowledge has been acquired, which enables the commencement, course, and force of the wind and rain storms, to be determined with almost the precision of prophecy. There is no reason why agriculture should not become a science as exact and certain as that of war, or any other science. Nature's laws respecting the growth of vegetation and the formation of grain and of the production of fruit, are as certain and uniform as are the laws which govern projectiles and the usual means of offense and defense in actual warfares. The difficulty has been that nature has not been inquired of systematically and thoroughly respecting these laws. The Government has not employed persons to investigate Nature's laws in respect to husbandry, and the only useful information we have in respect to such matters is that which is acquired from practical farmers, and unfortunately for the cause of agricultural science, the practical farmer has seldom the time, and less often the inclination, to give others the information which he has, and a knowledge of which is indispensable to the making of agriculture an exact science.

If, however, our farmers should give, through the different agricultural societies, the practical information which they possess, and if, either through premiums offered for that purpose, or through appropriations made by the State Legislature, careful analysis should be made of the soil of our valleys, and of the kind of fertilizers used, it would require but a few years to enable the Professors of our Agricultural College to build up a system of practical knowledge respecting agricultural pursuits that would enable them to train our young men for the calling of a farmer with as much certainty of usefulness in that occupation as are the cadets of our Military Academy in the calling of arms. The land which this year produced fifty bushels of wheat to the acre, ought, were Nature's laws fully known, and carefully followed, produce an equal amount the next, since the growth and production of crops are no more accidental than are the heaving of old ocean's tide, when it swells under the influence of Nature's laws of attraction. It is urged that there can be no certainty of crops because of a want of the certainty of sufficient moisture for their growth. But cannot this moisture be supplied by artificial means? Is it not within the power of the people of this State to afford facilities for the irrigation of the soil, so that the necessary element for the growth of grain, moisture in the soil, may be ever present when required?

Egypt is a rainless country, and yet it was once the granary of the East; and it then owed, and now owes, to irrigation, by the overflow of the river Nile, its entire fertility.

India, China, Italy, Spain, and Peru, are indebted to the irrigation afforded by their rivers, and by artificial canals, for much of their productiveness.

Utah would now be mostly an unproductive desert were it not for the system of irrigation inaugurated by the Mormons. And in this State, irrigation, wherever used, has astonished even its most enthusiastic advocates, by its favorable results.

The most important inquiry remains, namely: How are the facilities for irrigating their land to be afforded to our farmers? Such facilities can only be furnished by system and capital. The sovereign power of the State must be invoked in some form to enable the necessary canals and works to be constructed. No individual or company can carry water over the land of a private person without his consent, unless by virtue of the right of eminent domain possessed by the State, and which, can only be exercised under authority of the State Legislature. The different corporations which are now seeking to obtain control of the waters of the principal rivers of the State for purposes of irrigation, can only obtain such control through the action of the Legislature representing the power of the people to whom these waters belong. In the San Joaquin Valley two years out of every five the crops have failed. If, by the use of the waters of the rivers of the valley, full crops could be insured to the farmers every year, the value of the right to the permanent use of such water for purposes of irrigation would be equal to two fifths of the value of the land itself. If land without irrigation be worth ten dollars an acre, the permanent right to furnish water for the irrigation of this land would be worth, at the very least, four dollars for every acre of land that could be so irrigated, and if there be five million acres of land in the valley that can be irrigated, then the exclusive right to furnish water for such irrigation would be worth, at the very lowest estimate, the enormous sum of twenty million dollars. But, in case of a failure of crops, the farmer sustains a positive loss of his labor and seed grain, and it would not be extravagant to estimate the value of the franchise to furnish water for the irrigation of the land in this valley to be greater than the present value of the land which can be irrigated thereby, and this valuable franchise, as our laws now are, is within the reach of the first appropriator of these waters for the purposes of irrigation. This is a matter which should command the serious attention of the farmer and of the incoming Legislature.

It is urged that this matter will be controlled by competition between the different companies formed for the purpose of constructing irrigating canals. There would be much of wisdom in this suggestion, were it not that the supply of water for the purposes of irrigation in this State is limited, and that the company which first appropriates these waters, can, after they are once appropriated, set all other companies, and even the people themselves, from whom the right to appropriate those waters was first obtained, at defiance. Unless speedy legislative action be taken, placing limitations and restrictions on the power of these water companies, the people of this valley will have greater cause of complaint from these exactions than they now have or ever had of complaint against the exactions of railroad companies. Competing lines of railroads can, with capital, be constructed at any time, but competing water ditches, when once all the surplus water of the valley has been appropriated, can never be built.

The problem as to the best method of constructing a system of irrigating canals in California is yet to be solved. A similar problem was once to be solved in the now great State of New York. The rich lands in the central and western portions of that State were once comparatively valueless, on account of the expense of transporting to market the grain raised in those portions of that State. It was a problem in which the whole State was interested, and its solution was a then present need. The State of New York solved the problem by constructing the New York and Erie Canal, and all the money and interest invested in that enterprise has been returned to the State, and the value of the taxable property of the State has been increased millions of dollars. The construction of a system of irrigating canals in this State is a present need, and as much so as was her great canal to New York, and it is a need which the State can alone adequately supply.

The State should inaugurate and construct a system of irrigating canals, and this can be done by the State without any increase whatever in the rate of taxation. The interest on the bonds which the State might issue to raise money for the construction of these canals and ultimately the principal, would be paid by the sale of the water to farmers for irrigation purposes, and after this money has been repaid by the farmers, the only expense to the farmers for irrigation would be the amount of money necessary to keep the canals in repair, and to pay the expenses of their superintendence. If capital seeks to construct these canals as a profitable investment, surely the people can afford their construction, on the credit of the people, and is a safe investment of their credit. In a matter so vital to the welfare of the people of this valley, as the control of the waters of the rivers of the valley, I, for one, prefer these waters should be under the control of the Government, which, in turn, is controlled by the people themselves, rather than under the control of one or more corporations, independent of the people, and whose interests are often antagonistic to that of the people.

I, for one, do not believe that the Government should take care of the rich and that the rich would then take care of the poor. I do not believe there is any natural antagonism between capital and labor, and, I further believe, that when such antagonism exists, it is usually through privileges granted by the Government which the poor cannot avail themselves of, and which thus becomes the peculiar property of the rich to the oppression of the laboring classes. It is nothing but mockery for the Government to say to the farmers of this valley, impoverished as they have been by a successive failure of crops, that the farmers, under the law as it now is, have the same right that the capitalist has to build these canals. The farmer has not the means to avail himself of the right; and he is as effectually excluded from all benefits of the law, as it now is, as he would have been had he been expressly exempted from its benefits by the very terms of the law itself.

The use of the waters of the valley is as essential to the farmer for the raising of his crops as is the land which he cultivates, and he has the right to demand of the Government, which he supports, to exercise its power and its credit to afford him that use, provided it can be done without loss or danger of loss to the State, and without increasing the burden of taxation on others. The State has expended large sums of money in building a State House in Sacramento. This was right, because the building of the State House was needed for the use of the Government, and the building is a credit to the State and an ornament to the place where it is located. This building has been constructed in part with the farmer's money, and the farmers have a right to ask the State to build a system of irrigating canals to be owned by the State, and the money for the construction of which will ultimately be paid by the farmers themselves; and which system, when completed, would increase the wealth and power of the State, and would be a far more enduring and creditable monument of its wisdom and enterprise than would be an hundred State Houses like that which adorns the seat of government of this State at Sacramento. Had a canal been constructed so that farmers on the west side of the San Joaquin River could, this present season, have been furnished with water for irrigation, they would gladly have given enough for its use to have paid one half of the expense of building the canal. There is a prejudice against the building by the Government of works of internal improvement, but when such works are necessary for the welfare of large masses of the community, and when they cannot be constructed by individuals without danger of oppression of the people, it is the right, it is the duty, of the Government to construct such works and to keep them under its own management and control. Such a work was the grand canal built by the State of New York, which united the navigable waters of the Hudson River with the waters of the great lakes. Such a work would be the construction of a system of irrigating canals in the great valleys of this State. It will be urged that the Constitution of this State prohibits the people from using the credit of the State in these great works of needed improvement; then amend the Constitution, since the Constitution is made for the people, and not the people for the Constitution, and a constitutional provision which, in an early day, was wise, to prevent the lavish and useless expenditure of the people's money, is unwise when it prevents the making of improvements which the people themselves require.

The waters of our rivers are no more than sufficient, if in fact they be sufficient, for the irrigation of our arid valleys; and the canals constructed for that purpose should be built on some uniform system that would best utilize all the waters of these rivers, and would prevent, so far as it can be done, the clashing of conflicting interests. This cannot be effected by independent companies, and can only be accomplished by the State itself. I have hitherto estimated the value of water for the purpose of irrigation, to be no greater than that of the land itself irrigated thereby. But experiments in this State show, that land which would not pay as an investment for the purpose of raising crops without irrigation, at ten dollars an acre, would, with irrigation, pay as an investment for raising grain, at fifty dollars an acre—the excess is the value of the water as compared with that of the land; or, in other words, while the value of the land itself is only ten dollars an acre, the value of the water is forty dollars for every acre that can be irrigated thereby, and the value of the water to irrigate the five millions of acres of land susceptible of irrigation is actually worth the enormous sum of two hundred million dollars. Yet the State, by its present policy, will soon permit the valuable franchise of owning and controlling these waters to be held by a few grasping monopolies to the oppression of the farmer; and not only this, the State has actually conferred on these monopolies a portion of the State's sovereignty to enable them to manage and control these waters. A few years since we were startled by the attempt to control the waterfront of our principal harbor by what was known as the bulkhead scheme. We to-day complain (whether causelessly or not, this is not the occasion to discuss), of the exactions and oppressions of railroad companies. Yet the people are quiet and apparently indifferent while the waters of our rivers, which are vital for the prosperity of the farming community, are being appropriated by private corporations, and the State, through its laws, is actually favoring and encouraging such appropriation. When the appropriation of these waters has once been made, the farmers of our great valleys will be more completely in the power of those monopolies than they now are or ever can be in the power of any railroad company whatever.

It may be stated as a safe rule, that when works of internal improvements are vital to the prosperity of the people of the State, and such works cannot be constructed by private corporations without danger of monopoly and oppression, such works should be constructed by the State itself. The State required buildings for its insane, its deaf and dumb, its blind, for the keeping of criminals who violated the laws. These buildings are properly constructed by the State itself, and not by private corporations. The State requires for its permanent prosperity that the waters of her rivers should be utilized for the production of crops. This can only be accomplished with safety to the people by the State itself. The City of New York needed an abundant supply of wholesome water for the use of her inhabitants; she did not entrust to private enterprise and to consequent private monopoly the task of supplying this need; but the city itself built the Croton Waterworks. The waters of the rivers of this valley are as essential to the prosperity of our farmers as is the land which they cultivate; as is the rainfall on the land itself; as are the Croton Waterworks to the inhabitants of the great commercial metropolis of the Western Continent; and it would be as great a folly for this State to give private corporations the monopoly of the control of the waters of our rivers, as it would have been for the city of New York to have conferred on a private corporation the monopoly of furnishing the water necessary for the use of the inhabitants of that city.

In this State, however, the Legislature has, with lavish hand, bestowed on private corporations the monopoly of constructing works of needed improvement, and would doubtless, could it have been accomplished, have conferred on private corporations the monopoly of owning and controlling the Heaven-sent rains, and the circumambient air, and the people have patiently seen franchises most vital to their welfare conferred on private corporations, under the specious pretense that such companies could better be intrusted therewith than could the State itself. After the monopoly has been created and the people are suffering from its exactions, then for the first time complaints are heard, and relief is sought from the Legislature, when, by reason of vested rights, such relief cannot be given, even by the Legislature itself. The State should protect its citizens from monopoly and oppression, and if works of needed improvements be necessary for the prosperity of large masses of the community, such works should be built by the State itself, and then all danger from monopolies, concerning which so much complaint is now being made, would be effectually averted. I will quote, in conclusion, the language of one of the graduates of our State University:

"No known land more needs than California the aid of science to develop her resources. In no known land can science do more toward their development. Science can render California rich in agricultural wealth. Bounteous Nature scattered her golden sands along the beds of her streams; she mingled the earth of the hillsides with bright, shining particles of pure gold; she embedded in the quartz foundations of the firm hills the riches of mineral wealth; she furnished the valleys with fertile soil, and placed on the mountain tops inexhaustible reservoirs of grain-giving moisture; she has tempered the heat of Summer by the health-bearing ocean breeze, and has chained the biting frosts of Winter on the summits of the mountain ranges."

Nature has done her share for California, and it but remains for her people to do their part to render this, our chosen State, as preëminent for her agricultural productions as she has been for her mineral wealth.

TRANSACTIONS

OF THE

Sonoma and Marin District Agricultural Society

FOR

THE YEAR 1873.

REPORT.

To the honorable the State Board of Agriculture:

Gentlemen: In accordance with the provisions of an Act of the Legislature of California, entitled "An Act for the encouragement of agriculture and other industries," approved March first, A. D. eighteen hundred and seventy-two, the Board of Managers of the Sonoma and Marin District Agricultural Society, herewith submit their annual report for the year eighteen hundred and seventy-three:

To amount cash received, 1873	$8,201 24	
DISBURSEMENTS.		
By amount paid premiums		$1,281 50
By amount paid purses		1,420 00
By amount paid current expenses		5,551 62
By amount paid deficit	51 88	
Totals	$8,253 12	$8,253 12

PREMIUMS AWARDED.

HORSES.

Animal.	Name.	Exhibitor.	Premium.
Thoroughbred.			
Best stallion, four years old or over	Ironclad	John Hall	Dip. and $25
Best stallion, three years old and under four		James Watson	$20
Best stallion, two years old and under three	Thornwood	John Hall	$15
Best stallion, one year old and under two		James Watson	$10
Best mare, four years old or over	Florence	John Hall	$20
Best mare, three years old and under four	Lady Franklin	John Hall	$15
Best mare, two years old and under three		J. G. Underhill	$10
Best suckling colt		John Hall	$5
Graded horses.			
Best stallion, four years old or over		P. H. Pharriss	Dip. and $15
Best stallion, one year old and under two		R. H. Crane	$5
Best mare, four years old or over		Robert Crane	$12
Best mare, three years old and under four	Platina	S. Daniels	$9
Best mare, one year old and under two		W. Edminster	$6
Best suckling colt		S. Daniels	$5
Horses of all work.			
Best stallion, four years old or over	Ottawa Chief	J. Dardis	Dip. and $10
Best stallion, three years old and under four	America	T. B. Cary	$10
Best stallion, two years old and under three	Jim	H. Hinebaugh	$8
Best mare, four years old or over	Snip	J. Underhill	$10
Best mare, three years old and under four	Floretta	W. D. Bliss	$8
Best mare, two years old and under three	Dolly	H. Hinebaugh	$5
Draught horses.			
Best stallion, four years old or over	General Grant	J. McDevitt	Dip. and $15
Best stallion, three years old and under four		D. Stewart	$15
Best stallion, two years old and under three	Prince Pollock	M. Kirk	$10
Best mare, four years old or over		D. Stewart	$12
Best mare, two years old and under three		G. D. Green	$7
Best mare, one year old and under two		G. D. Green	$5

HORSES—Continued.

Animal.	Name.	Exhibitor.	Premium.
Roadsters.			
Best stallion, four years old or over		Robert Crane	$15
Best stallion, three years old and under four		J. M. McShafter	$15
Best stallion, two years old and under three	Mark Twain	R. Looney	$10
Best gelding, three years old or over		Luke Fallon	$12
Best mare, four years old or over		Mr. Irvine	$12
Best mare, three years old and under four		J. Merchant	$9
Carriage and saddle horses.			
Best double team roadsters, owned and used by one person	Emma and Queen	S. Daniels	$12
Best single buggy horse		A. Doty	$9
Best saddle horse		W. Kee	$5

Special mention is made, and the thanks of the society expressed to J. D. Carr, for exhibiting his horse Membrino, which animal could not compete for premium, not being owned within the district.

CATTLE.

Animal.	Name.	Exhibitor.	Premium.
Thoroughbred.			
Best Durham bull, four years or over	Old Sam	Carr & Chapman	$20
Best Durham bull, three years old and under four	Romeo	Carr & Chapman	$15
Best Durham bull, two years old and under three	Mazourka Royal Oxford	Page Brothers	$10
Best Durham cow, four years old or over	Lady Solway	Carr & Chapman	$15
Best Durham cow, three years old and under four	Maid of Athens	Carr & Chapman	$10
Best Durham heifer, two years old	Hope	Carr & Chapman	$8
Best Durham heifer, one year old	Pet of Geneva	Carr & Chapman	$5
Best Durham calf	Sonoma	Page Brothers	$5
Best Devon bull, two years old and under three	Curly	S. Daniels	$10
Best Devon bull, one year old and under two	Victor	S. Daniels	$8
Best Devon cow, four years old	Nancy	S. Daniels	$15
Best Devon cow, three years old and under four	Fanny	S. Daniels	$10
Best Devon calf		S. Daniels	$5

CATTLE—Continued.

Animal.	Name.	Exhibitor.	Premium.
Best Alderney bull, four years old or over	Emperor Billy	A. Maillard	$20
Best Alderney bull, one year old and under two	Black Prince	W. D. Bliss	$8
Best Alderney cow, four years old or over	Eliza	A. Maillard	$15
Best Alderney cow, three years old and under four	Cora	A. Maillard	$10
Best Alderney yearling	Bessie	A. Maillard	$5
Grade stock.			
Best bull, four years old or over.		D. S. Dickson	$15
Best bull, three years old and under four	Priam	P. McCleave	$10
Best bull, two years old and under three		Richard Harris	$6
Best bull, one year old and under two		P. Mullaly	$4
Best cow		Page Bros	$10
Best heifer		Geo. Cary	$7
Sweepstakes.			
Best herd of not less than eight and not more than three males.		Carr & Chapman	$25

SHEEP—THOROUGHBRED.

Animal.	Exhibitor.	Premium.
Best three French merino ewes	Messrs. Hill & Co	$10
Best Spanish buck	H. Mecham	Diploma and $10
Best three Spanish ewes	Hill & Co	$10
Best Southdown buck	R. Crane	Diploma and $10
Best three Southdown ewes	R. Crane	$10
Best Cotswold buck	John Hudson	Diploma and $10
Best three Cotswold ewes	John Hudson	$10
Best four Spring lambs	John Hudson	$5
Grade stock.		
Best buck	D. S. Dickson	$8
Best three ewes	D. S. Dickson	$8

GOATS.

Animal.	Exhibitor.	Premium.
Best Angora goat	S. A. Rendall	Diploma and $10
Best three Angora ewes	S. A. Rendall	$10
Best four Angora kids	S. A. Rendall	$5

SWINE.

Animal.	Exhibitor.	Premium.
Best Berkshire boar	George W. Burbank	Diploma and $8
Best Berkshire sow	William Hill	$5
Best Essex boar	D. Stewart	Diploma and $8
Best Essex sow	D. Stewart	$5
Grade stock.		
Best boar	R. H. Crane	$6
Best sow	R. H. Crane	$4
Best five pigs under six months	D. Stewart	$5
Finest and fattest hog	R. Crane	$5

POULTRY—PURE BLOOD.

Animal.	Exhibitor.	Premium.
Best exhibit of not less that five varieties	T. D. Morris	Silver pitcher—$15
Best trio Light Bramahs	Sullivan & Schwartz	$2 50
Best trio Dark Bramahs	John Judson	$2 50
Best trio Buff Cochins	Frank Ennis	$2 50
Best trio Houdans	T. D. Morris	$2 50
Best trio English Game	T. B. Carey	$2 50
Best trio Silver-spangled Hamburgs	T. D. Morris	$2 50
Best trio Golden-spangled Hamburgs	T. D. Morris	$2 50
Best trio White Polands	Sullivan & Schwartz	$2 50
Best Light Bramah cock	T. D. Morris	$3
Best trio Sultanas	T. D. Morris	$2 50
Best four Spring chickens, of any of the above breeds	Frank Ennis	$2 50
Trio White Leghorn	H. D. Sutton	Special mention.
Best exhibit Rouen ducks	R. Crane	$2 50
Best exhibit Muscovy ducks	George Tighe	$2 50
Best exhibit Bronze turkeys	Sullivan & Schwartz	$2 50
Best exhibit peafowls	T. D. Morris	$5
Best exhibit geese	R. Crane	$2

GRAIN, VEGETABLES, ETC.

Article.	Exhibitor.	Premium.
Best sack Australian wheat	D. Stewart	$5
Best sack Club wheat	George D. Green	$5
Best sack barley	George D. Green	$5
Best sack rye	J. Kendall	$4
Best sack oats	Robert Finley	$5
Best exhibit grain, not less than four varieties	H. P. McCleave (wheelbarrow, by Zartman & Co)	$15
Best sack wheat flour	A. McCune (by Cox & Pierce)	$5
Best sack corn meal	A. McCune	$3
Best ham	R. Crane (by Lamoreaux & Brown)	$3
Best collection potatoes	John Kendall (by L. F. Carpenter)	$5
Best exhibit onions	John Kendall (by Needham & Roach)	$2
Best exhibit squashes	T. Skillman	$2
Best exhibit sugar beets	C. S. Gibson	$2
Best exhibit mangelwurtzel	C. S. Gibson	$2
Best six blood beets	C. S. Gibson	$2
Best exhibit rutabagas	John Kendall	$1 50
Best exhibit corn on stalk	Robert Finley (by John Ferguson)	$2 50
Best exhibit broomcorn	A. Doty	$3
Best exhibit cultivated grass seed	O. Hubbell	$3
Best exhibit hops	Otis Allen	$3
Best exhibit cabbage	John Kendall	$2 50
Best exhibit watermelons	David Lodge	$2
Best exhibit carrots	John Kendall	$1
Best display of garden vegetables	John Kendall (by S. D. Towne)	$3

FRUITS, GRAPES, NUTS, ETC.

Article.	Exhibitor.	Premium.
Largest and best collection of fruit raised in one orchard	W. H. Pepper	Silver pitcher, $25.
Best exhibit of apples	W. H. Pepper, (by Wm. Holmes)	$5
Best single variety Newton pippins, six apples	J. Purrington, (by Brady & Co.)	$2 50
Best six varieties of apples, three each.	J. Purrington	$3
Best collection of pears	W.H.Pepper, (by Kelly Tighe)	$5
Best single variety, six pears	John Sherry	$2
Best six varieties of pears, three each.	W. H. Pepper	$3
Best six quinces	T. D. Morris	$2
Best collection of oranges	N. Carriger, (by George Pearce)	$5
Best collection of lemons	Mrs. Fowler	$3
Best collection of grapes	T. D. Morris	Silver pitcher—$15
Best collection of foreign grapes	T. D. Morris	$5
Best exhibit California grapes	N. Carriger	$2
Largest bunch of grapes	T. D. Morris, (Buck Gloves, by M. Berger).	$3
Best collection of figs	Mrs. Fowler, (napkin ring, by Bryant & Hopkins)	$2
Best collection of almonds	T. D. Morris, (glass fruit dish, by Bryant & Hopkins)	$1 50
Best collection of English walnuts	R. Crane	$2
Exhibit of olives and pomegranates	Mrs. Fowler	Honorable mention.

DRIED FRUITS, PRESERVES, ETC.

Article.	Exhibitor.	Premium.
Best exhibit of dried fruits, not less than five varieties	J. Purrington	$10
Best exhibit of dried apples	J. Purrington	$2
Best exhibit of dried peaches	George D. Green	$2
Best exhibit of canned fruit	Mrs. Berger, (box tea, by H. Steitz)	$5
Best exhibit of preserves	Miss Lizzie Purrington, (dress pattern, by Weil & Co.)	$5
Best exhibit of jellies, not less than five varieties	Miss M. E. Green	$5
Best exhibit of side bacon	R. Crane, (album, by H. Baruh)	$5

BUTTER AND CHEESE.

Article.	Exhibitor.	Premium.
Best exhibit of cheese	J. E. Jewell, (by Bowman & Bro.)	$5
Best box of fresh butter	J. E. Jewell, (by H. T. Fairbanks,)	$10
Best packed butter	D. Stewart, (box tea, by C. W. Symonds)	$4

WINE, CIDER, ALE, Etc.

Article.	Exhibitor.	Premium.
Best exhibit wines	John Kron	Dip'a and sil. pitch., $15
Best exhibit port wine	John Kron (by L. Haubrich)	$5
Best exhibit red wine	John Kron (by Dan Eagan)	$5
Best exhibit white wine	Charles Krug (by J. Vander Noof)	$5
Best exhibit brandy	Charles Krug (by Hess & Co	$5
Angelica and sweet muscatel	Charles Krug	Honorable mention.
Best exhibit beer	C. Michener	$2 50
Best exhibit cider	B. F. Connolly	$2
Best exhibit soda	B. Connolly (by J. Blume)	$2 50

DOMESTIC MANUFACTURE.

Article.	Exhibitor.	Premium.
Best mechanical display	Wm. Zartman & Co	Dip'a and sil. pitch., $15
Best exhibit blacksmithing	Wm. Zartman & Co	$5
Best exhibit iron or brass castings	G. W. Young	$5
California Chemical Paint Company's exhibition	Chemical Paint Co	Honorable mention.
Best exhibit boots	Schwartz & Allen	$5
Best exhibit leather	P. M. Johnson	Diploma and $5
Best exhibit brooms	R. Looney	$2 50
Best washing machines	Drummond & Holly	$3
Best cooperage	Isaac Fuller	$3
Best cane work	Eddie Lippitt	$2
Exhibit California machine and sewing silk	California Man'f'g Co	Diploma.

CARRIAGES, BUGGIES, AND WAGONS.

Article.	Exhibitor.	Premium.
Best exhibit carriages, buggies, and wagons	Wm. Zartman & Co	Dip'a and sil. pitch., $25
Best family carriage	Wm. Zartman & Co	$12
Best buggy	Wm. Zartman & Co	$10
Best spring wagon	Wm. Zartman & Co (by I. G. Wickersham)	$10
Best carriage painting	H. Pimm	$8
Best carriage trimming	Gwinn & Brainerd	$8

SADDLERY AND HARNESS.

Article.	Exhibitor.	Premium.
Best exhibit saddlery	Gwinn & Brainerd	Diploma and $15
Best set double harness	Gwinn & Brainerd	$7 50
Best single harness	Gwinn & Brainerd	$5
Best saddle	Gwinn & Brainerd	$4
Best exhibit apprentice work	C. W. Burgtorf	$2 50

AGRICULTURAL IMPLEMENTS.

Article.	Exhibitor.	Premium.
Best cultivator	J. Loranger	$5
Best harrow	C. P. Hatch	$3
Corn and potato cultivator	C. P. Hatch	Special mention.
Rake and seed sower	Drummond & Holly	Honorable mention.
Best wheelbarrow	Wm. Zartman & Co	$2

PAINTING, ORNAMENTAL WORK, ETC.

Article.	Exhibitor.	Premium.
Best collection paintings	George Ross	$10
Best specimen painting in oil, on canvas	C. W. Alexander	Shawl—$5
Best specimen painting in water colors.	George Ross	$3
Best specimen portrait painting	J. Q. Reed	$3
Best collection photographs	J. Q. Reed	$5
Best specimen pencil drawing	Edward Healy	Silk sash—$2 50
Best specimen wax work	Mrs. I. G. Wickersham.	$3
Best specimen leather work	Rosa Haskins	$3
Best specimen shell work	Mrs. L. W. Miller	$3
Best specimen bead work	Mrs. L. W. Miller	$3
Best piece worsted embroidery	Miss S. Cofer	Set curls—$8
Piece worsted embroidery	Mrs. Falkner	Honorable mention.
Piece worsted embroidery	Miss E. J. Wilsey	Honorable mention.
Best worsted picture	Miss Cassie Mulgrew	Silver pitcher—$7 50
Best silk embroidery	Mrs. L. W. Miller	Pair lady's gaiters—$4
Best cotton embroidery.	Mrs. R. Hall	$3
Cotton embroidery	Mrs. P. Sweeney	Honorable mention.
Best chenille work	Mrs. L. W. Miller	Set silver forks—$6
Best crochet work	Mrs. O. Hubbell	$2
Crochet work	Miss Sophie Taft	Special premium rec.
Best tatting	Mrs. R. Hall	$1
Tatting	Mrs. A. Meade	Honorable mention.
Best piece knitting	Lizzie Shaver	$2
Best rag mat	Mrs. Mary A. Hall	A hat—$5
Best rag carpet	Miss M. Jewell	$4
Best sewing machine for all purposes, Grover & Baker	C. W. Otis	Diploma.
Best sewing machine for fancy work, Grover & Baker	C. W. Otis	Diploma.
Best home-made baby's dress	Mrs. J. S. Shepperd	$2 50
Best boy's suit	Mrs. A. B. Derby	$3
Best gent's shirt	Mrs. A. B. Derby	$2
Best quilting	Mrs. J. R. Ross	$3
Quilting	Mrs. Pickett	Honorable mention.
Suit lady's underclothes	Miss Emory	
Best exhibit millinery	Miss O'Gorman	$5
Best bonnet	Mrs. A. Kelly	Pair lady's shoes—$3 50

BREAD, CAKES, AND CONFECTIONS.

Article.	Exhibitor.	Premium.
Best sample of bread by a miss under twelve years	Miss Christie Stewart	$3
Best wheat bread	Mrs. J. Campbell	$3
Best corn bread	Mrs. A. B. Derby	$2 50
Best pound cake	Mrs. A. B. Derby	$4
Best coffee cake	Mrs. A. B. Derby	$2
Best sponge cake	Mrs. A. B. Derby	$3
Best assortment tarts	Mrs. A. B. Derby	$3

PLANTS, BOUQUETS, WREATHS, ETC.

Article.	Exhibitor.	Premium.
Best collection of trees, shrubs, and flowering plants	E. S. Lippitt	Silver pitcher—$25
Collection of trees, shrubs, and flowering plants	Mr. Pepper	Honorable mention.
Best exhibit ornamental foliage plants	W. H. Pepper	$5
Best miniature garden	E. S. Lippitt	$5
Best floral design	Miss Rena Shattuck	Pair lady's shoes—$5
Best exhibit of cut roses	E. S. Lippitt	$2
Best exhibit of cut dahlias	E. S. Lippitt	$2 50
Best pair vase bouquets	W. H. Pepper	$2
Best exhibit fuschias	E. S. Lippitt	$2 50
Best exhibit geraniums	E. S. Lippitt	$2 50
Best pelargoniums	W. H. Pepper	$2 50
Best exhibit hardy evergreen trees and shrubs for garden	W. H. Pepper	$2 50
Best exhibit cactus and cereus	E. S. Lippitt	$2
Canna	Miss Helen Wallace	Special mention.

CHILDREN'S DEPARTMENT.

Article.	Exhibitor.	Premium.
Best pure worsted embroidery	Miss Frank Shattuck	$2 50
Best wax work	Lulu Ellsworth	$1 50
Best transferred work	Miss Frank Shattuck	$2
Best darning	Sallie Dickson	$2
Best rag rug	Miss Luella Miller	$1
Best patchwork quilt	Sallie Dickson	$2
Best pencil drawing	Clarence Healey	$1
Best crayon drawing	Miss Frank Shattuck	$1
Best hair work	Miss Franklin	$1
Best bead work	Miss Frank Shattuck	$1
Bead work	Miss Rachel Berger	Honorable mention.
Best penmanship by girl—epistolary	Miss Katie Griffin	$2

SPECIAL MENTION.

Article.	Exhibitor.	Premium.
Angora goat skins	S. A. Rendall	Special mention.
Sluthour pumps	J. M. Keeler	Special mention.
Carpets	A. McKay	Special mention.
Rope	Tubbs & Co	Special mention.
California silk	California Silk Manufacturing Company	Diploma.
Agricultural implements	George F. Allen	Honorable mention, with thanks of the Society.
Cultivator	C. P. Hatch	Honorable mention.
Patent gate	L. E. Brooks	Special mention.
Very fine trotting sulky	John Loranger	Special mention.
Woods' mower and reaper		Special mention.
Exhibit game fowls	J. Loranger	Special mention.
Pat. wire suspension vibrating spring	C. V. B. Reeder	Special mention.
Carriage springs and wagon	Betts & Brother	Honorable mention.
Patent fruit drier	Keeler, Hine & Thomas	Honorable mention.
Worsted and wax work	Mrs. Haubrich	Honorable mention.

The exhibition in many respects is the best ever held in the district. The animals and articles exhibited, although not as numerous as heretofore, were all of a higher order of merit, and showed most conclusively the wide and beneficial influence of our district Fairs. It should be the aim of each Fair to both stimulate and cultivate the people, that all our productive industries may be enlarged and perfected, and all the homes and families of the State be made more cheerful and refined.

There has been a steady increase in the district in the number and variety of our agricultural products, and in the variety and magnitude of our manufactures. We are but just beginning, however, to apply the results of scientific investigation to our systems of farming. But the people, once aroused, will make rapid progress, and in a few years we hope to show at our Fairs the grand results of a generous enterprise and intelligence in our homes and the products of our industry. Our resources are bountiful, our energy great, and we hope for wisdom to develop and use.

E. DENMEN,
President.

E. S. LIPPITT, Secretary.

TRANSACTIONS OF THE
NORTHERN DISTRICT
Agricultural, Horticultural, and Mechanical Society,
FOR
THE YEAR 1873.

OFFICERS OF THE SOCIETY.

W. H. PARKS	President.
M. C. DUFFICY	Secretary.

BOARD OF DIRECTORS:

W. H. PARKS, M. C. DUFFICY, JAMES COOK, S. C. HUTCHINGS,
P. C. SLATTERY, J. B. McDONALD.

REPORT.

To Hon. Robert Beck, Secretary of the State Agricultural Society of the State of California:

SIR: The Northern District Agricultural, Horticultural, and Mechanical Society of the State of California, offer the following report of transactions, list of articles exhibited, and premiums awarded, for the year ending November twenty-ninth, eighteen hundred and seventy-three; also the receipts and expenditures of the society for said term.

W. H. PARKS, President.

M. C. DUFFICY, Secretary pro tem.

FINANCIAL REPORT.

RECEIPTS.			
M. Marcuse, ex-Treasurer		$51 79	
One hundred and twenty-seven memberships, at five dollars		635 00	
Pool privilege		425 00	
Subscription account		995 50	
Entrance to races		1,010 00	
Quarter-stretch badges		7 50	
Hack tickets		75 00	
Single admission to Park		871 10	
Single admission to Grand Stand		106 00	
Pavilion receipts		180 00	
Premium returned		3 00	
State appropriation		2,000 00	
			$6,359 89
EXPENSES.			
Warrant No. 1		$57 50	
Donley, as per bill of sundries expended		87 28	
Entrance of Gen. Reno, purse No. 11, refunded.		35 00	
P. Wall, membership on old account		5 00	
M. L. Beach, membership on old account		5 00	
D. E. Knight, entrance		15 00	
J. M. Allenwood, entrance		15 00	
Purses		2,580 00	
Discount on State appropriation		135 00	
Premium list, Pavilion	$253 00		
Premium list, Park	680 00		
		933 00	
General expenses, cash book, page twenty-one		1,472 36	
Waterworks		577 49	
Labor at Park		377 95	
Labor at Pavilion		89 00	
			$6,384 58
Balance of expenses over receipts			$24 69

PREMIUMS AWARDED AT THE PAVILION.

THIRD DEPARTMENT.

CLASS I.

Article.	Exhibitor.	Residence.	Premium.
Best ten yards domestic rag carpet	Hiram Bruce	Yuba County	$5
Best domestic rag	T. F. Kimball	Yuba County	$10
Best gentleman's shirt	Miss Mary Baker	Yuba County	$5

CLASS II.

Article.	Exhibitor.	Residence.	Premium.
Best saddletrees	S. E. Love	Yuba County	$3

CLASS III.

Article.	Exhibitor.	Residence.	Premium.
Best needlework	Mrs. J. E. Hobson	Yuba County	$3
Best hand sewing	Miss Nellie Hathwell.	Yuba County	$3
Best worsted mats	Miss Ida Atchison	Yuba County	$3
Best embroidered picture	Miss Ella McMahon.	Sutter County	$5
Best embroidered lady's robe	Mrs. A.N.Stevenson.	Sutter County	$3
Best silk embroidery	Mrs. Dr. Dobbins	Yuba County	$3
Best embroidered sofa cushion	Mrs. J. E. Hobson	Yuba County	$3
Best tatting	Miss Emma Blodgett	Yuba County	$2
Best display of millinery	Mrs. M. Lindsey	Yuba County	$10
Best artificial flowers	Miss Lizzie Lydon	Yuba County	$5
Best specimen shellwork	Mrs. J. E. Hobson	Yuba County	$5
Best patchwork quilt	M. L. Beach	Yuba County	$5
A special premium awarded to Mrs. Congdon, an aged lady of seventy-five years, for patchwork quilt	Mrs. Congdon		$5

FIFTH DEPARTMENT.

CLASS II.

Article.	Exhibitor.	Residence.	Premium.
Best exhibit of wheat, one variety, viz: "Pride of Butte"	Wilhelm Van Woert.		Spec. ment'n.
For wheat bread and flour, made of same	Wilhelm Van Woert.		Spec. ment'n.

CLASS III.

Article.	Exhibitor.	Residence.	Premium.
Best exhibit blood beets	T. J. McCormick	Yuba County	$1
Best exhibit blood turnips	M. L. Beach	Yuba County	$1
Best display of flowers (seventy varieties)	Mrs. D. B. Lowery	Yuba County	$10

CLASS V.

Article.	Exhibitor.	Residence.	Premium.
Best domestic brown bread	Mrs. Dan. McCarthy.	Yuba County	$5
Best domestic corn bread	Mrs. D. B. Lowery	Yuba County	$5
Fancy straw basket and picture frames	Miss Ida Atchison	Yuba County	$3
Little baby daisey	Miss Edith Clothier	Yuba County	$1
Display of hair work and shaving flowers, which, for beauty of design and skillful workmanship, is unequaled	Miss M. E. Moore	Yuba County	$3
Best display of shells and sea-moss	Miss Mary Bobs	Yuba County	$3
Best specimen of hair work	Mrs. E. J. Sherman	Yuba County	$3
Exhibit of cakes	Mrs. A. N. Stevenson.	Sutter County	$3
Best domestic wheat bread	Mrs. M. Munson	Yuba County	$5

Special mention is made by the committee, in this department, of the following: Champion churn, F. Fischer, Sutter County; eye cups, Zozo catarrh snuff, and Zozo eye ointment, James Gray, Sutter County; Babcock fire extinguisher, exhibited by George North, agent, Yuba County; nine coils rope, manufactured by the San Francisco Cordage Factory, exhibited by George North, Yuba County; air castles, Misses Amelia Dunning and Carrie McCubbins, Yuba County; leather work, exhibited by Miss Katy Hunt, Yuba County; imitation of coral brackets, exhibited by Miss A. Rosenberg, Yuba County; Bramah eggs, exhibited by T. J. McCormick, Yuba County.

CLASS VI.

Article.	Exhibitor.	Residence.	Premium.
Best exhibit pickled fruits	Mrs. A. Rosenberg	Yuba County	$3
Best exhibit catsup	Mrs. J. E. Hobson	Yuba County	$3

SIXTH DEPARTMENT.

CLASS I.

Article.	Exhibitor.	Residence.	Premium.
Best display apples	T. J. McCormick	Yuba County	$15
Best twelve varieties apples	S. Blodgett	Yuba County	$7
Best exhibit three varieties pears.	Miss Nel. Hathwell	Yuba County	$2
Best display of pears	T. J. McCormick	Yuba County	$15
Best display of peaches	S. Blodgett	Yuba County	$10

CLASS II.

Article.	Exhibitor.	Residence.	Premium.
Best display of five pounds dried apples	S. Blodgett	Yuba County	$5
Best ten pounds dried figs	S. Blodgett	Yuba County	$5
Best green figs	S. Blodgett	Yuba County	$3
Best soft shell almonds	S. Blodgett	Yuba County	$3

SEVENTH DEPARTMENT.

CLASS I.

Article.	Exhibitor.	Residence.	Premium.
Best exhibit of painting in oil	Miss Mary Bobs	Yuba County	$10
Best exhibit of landscape in oil	Mrs. A. Woods	Yuba County	$10
Best specimen landscape in oil	Miss Liz. McDaniel	Yuba County	$5
Best exhibit of pictures	Mrs. A. Woods	Yuba County	$15
Best ivorytype	Miss Mary Bobs	Yuba County	$3
Best exhibit of photographs	Mrs. A. Woods	Yuba County	$3
Best crayon drawing	Mrs. R. S. Jenkins	Yuba County	$3

MISCELLANEOUS DEPARTMENT.

On recommendation of the committee, the Board of Directors award special premiums as follows:

To Jewell & Co., wood pump and irrigating machine, five dollars.

"J. and J. D. Richey's Steam Washer, or Woman's Friend," is mentioned as a useful labor-saving machine, and a special premium awarded of five dollars.

PREMIUMS AWARDED AT THE PARK.

FIRST DEPARTMENT.

CLASS I—THOROUGHBRED HORSES.

No sworn pedigree having been presented by exhibitors in this class, the committee report that, under the society's rules, they are unable to make any award, but recommend that a premium be awarded to W. N. Rogers, for his mare Fashion, upon his producing pedigree, in compliance with the rules.

FAMILIES.

Animal.	Exhibitor.	Residence.	Premium.
Best stallion, Tiger, with ten of his colts	H. H. Hollister	Yuba County	$30

Judges—S. L. Daniels. E. L. Singletary, Watt Perdue, L. P. Walker, John Seaward, and Harmon Bay.

CLASS I—HORSES OF ALL WORK.

Animal.	Exhibitor.	Residence.	Premium.
Best stallion, four years old, Messenger Boy	James Clark	Yuba County	$25
Best stallion, three years old, Mountain Chief	J. H. Holtz	Yuba County	$20
Best stallion, two years old, Perdim, Jr.	R. M. Sparks	Yuba County	$15
Best stallion, one year old, Feather River Chief	R. Breeden	Yuba County	$10
Best sucking horse colt	H. H. Hollister	Yuba County	$5

Judges—W. P. Harkey, Harmon Bay, E. L. Hunter, Al. Calden, and J. H. Keyes.

CLASS II—MARES.

Animal.	Exhibitor.	Residence.	Premium.
Best mare, four years old and over with colt, Mary	J. M. Allenwood	Yuba County	$20
Best mare, four years old and over, Belle Friday	J. M. Allenwood	Yuba County	$15
Best mare, three years old, Lizzie	P. Wall	Yuba County	$10
Best mare, two years old, Nellie	George James	Yuba County	$5
Best mare, one year old, Maggie	G. M. McWain	Yuba County	$5
Best sucking mare colt, Fannie	H. H. Hollister	Yuba County	$5

FAMILIES.

Animal.	Exhibitor.	Residence.	Premium.
Best exhibit of six colts owned by one person, of any age or sex	H. H. Hollister	Yuba County	$20

CLASS III—DRAFT HORSES.

Animal.	Exhibitor.	Residence.	Premium.
Best stallion, four years old and over, Jim Copper Bottom	O. C. Hooper	Yuba County	$25

Judges—M. V. Sparks, Yuba County; S. L. Daniels and J. McIntosh, Butte County; A. S. Hemstreet, Colusa County; E. L. Singletary, and H. Bay.

CLASS IV—ROADSTERS.

Animal.	Exhibitor.	Residence.	Premium.
Stallion, best four years old, Billy McCracken, Jr.	Wm. Doty	Sutter County	$25
Stallion, best two years old, Jim Bloomsbury	J. M. McWain	Yuba County	$15
Gelding, best four years old and over, Dan Rice	Dennis McVicker	Yuba County	$30

MARES.

Animal.	Exhibitor.	Residence.	Premium.
Best mare, four years old and over, Kate Hayes	Thos. H. Devall	Yuba County	$20
Mare, best two years old, Ida Crane	J. M. Allenwood	Yuba County	$10

Judges—M. V. Sparks, Yuba County; A. S. Hemstreet, Colusa County; S. L. Daniels, Butte County; J. McIntosh, Harmon Bay, and E. L. Singletary.

CLASS V—CARRIAGE HORSES.

Animal.	Exhibitor.	Residence.	Premium.
Best matched span carriage horses, owned and used as such by one person—Flora and Fannie	G. E. Chittenden.	Yuba County.	$20

Judges—Harry B. Marker, P. H. Corrigan, J. E. Clark, Dr. Belton, John McIlmoil.

CLASS VI—SWEEPSTAKES.

Animal.	Exhibitor.	Residence.	Premium.
Best stallion of any age—Green Mountain Chief	W. Hartley	Yuba County	$50
Best mare of any age—Flora	John Seaward	Yuba County	$30

Judges—R. P. Walker, Sam Enlow, M. V. Sparks.

JACKS AND JENNETS—SPECIAL.

Animal.	Exhibitor.	Residence.	Premium.
Jack Eel River, three years old	G. E. Chittenden.	Yuba County	Sp'l prem. rec.
Jennet Nameless, seven years old	G. E. Chittenden.	Yuba County	Sp'l prem. rec.

Judges—Harry B. Marker, P. H. Corrigan, J. E. Clark, Dr. Belton, John McIlmoil.

CATTLE.

CLASS I—THOROUGHBRED.

Animal.	Exhibitor.	Residence.	Premium.
Bulls.			
Best bull, four years old and over—Monkey John	R. M. Sparks	Yuba County	$20
Best bull, three years old and over—First Duke of Sutter	John McIlmoil	Sutter County	$20
Best bull, one year old and over—Second Duke of Sutter	John McIlmoil	Sutter County	$10
Best bull calf—Newton Booth	M. V. Sparks	Yuba County	$5
Cows.			
Best cow, four years old and over—Miss Morgan	R. M. Sparks	Yuba County	$15
Best cow, three years old and over—Elfleedy 3d	R. M. Sparks	Yuba County	$15
Best cow, two years old and over—Starlight 2d	R. M. Sparks	Yuba County	$10
Best cow, one year old—Elfleedy 5th.	R. M. Sparks	Yuba County	$10

Judges—G. N. Swezy, G. E. Chittenden, T. D. Schaefer, S. Eaton, C. G. Bockius.

CLASS II—GRADED CATTLE.

Animal.	Exhibitor.	Residence.	Premium.
Bulls.			
Best bull, two years old and over—Dick	H. H. Hollister	Yuba County	$10
Best bull, one year old and over—Joe Jasper	R. M. Sparks	Yuba County	$10
Cows.			
Best yearling heifer—Rey	John McIlmoil	Sutter County	$5

Judges—G. N. Swezy, G. E. Chittenden, F. A. Schaefer, S. Eaton, and C. G. Bockius.

CLASS III—SWEEPSTAKES.

Animal.	Exhibitor.	Residence.	Premium.
Best bull, of any age or stock—Monkey John	R. M. Sparks	Yuba County	Framed diploma and $40
Best cow, of any age—Miss Morgan.	R. M. Sparks	Yuba County	Framed diploma and $40
Best bull calf—Newton Booth	M. V. Sparks	Yuba County	$20
Two fat steers — weighing 5,000 pounds	P. C. Slattery	Yuba County	Sp'l prem. rec.

Judges—G. N. Swezy, G. E. Chittenden, F. A. Schaefer, S. Eaton, and C. G. Bockius.

SWINE.

Animal.	Exhibitor.	Residence.	Premium.
Best boar, imported—Toronto	R. M. Sparks	Yuba County	$15
Best sow, imported—Betty	R. M. Sparks	Yuba County	$15
Best pen of imported pigs	R. M. Sparks	Yuba County	$15

Judges—E. W. Holloman, Dr. F. Dobbins, B. E. Hickok, and John H. Kimball.

The Committee on Agricultural Implements would respectfully call the attention of farmers to the Taylor harrow, manufactured by the Kimball Manufacturing Company of San Francisco, as an implement of practical utility, useful and well adapted to the majority of all farming lands, and recommend the society to award a special premium therefor.

TRANSACTIONS

OF

The Upper Sacramento Agricultural Society,

FOR

THE YEAR 1873.

OFFICERS OF THE SOCIETY.

PRESIDENT.

D. M. REAVIS	Chico.

VICE PRESIDENTS.

R. M. COCHRAN	Chico.
R. McENESPY	Chico.

TREASURER.

AUG. H. CHAPMAN	Chico.

SECRETARY.

GEO. J. BOURNE	Chico.

BOARD OF DIRECTORS.

J. L. Keefer,	Nord, Butte County.
I. R. Bennett	Chico, Butte County.
J. M. Hoyl	Chico, Butte County.
J. B. Swearingen	Butte County.
C. A. Miller	Chico, Butte County.
A. G. Toomes	Tehama, Tehama County.
J. C. Tyler	Tehama, Tehama County.
J. D. Byers	Susanville, Lassen County.
Grant I. Taggart	Shasta, Shasta County.
F. C. Graves	Olimpo, Colusa County.
J. M. Garner	Chico, Butte County.
J. W. B. Montgomery	Cana, Butte County.
Wm. Sharkey	Nord, Butte County.
John Boggs	Princeton, Colusa County.
C. C. Goodrich	Coppervale, Lassen County.
J. J. Waste	Chico, Butte County.
O. L. Clark	Chico, Butte County.
W. Bassett	Dayton, Butte County.
Moses Wick	Cottonwood, Butte County.
R. M. Cochran	Chico, Butte County.
Geo. W. Dorn	Chico, Butte County.

FINANCIAL REPORT.

To total receipts 1873		$6,193 12
Disbursements.		
By amount paid purses to races	2,200 00	
By amount paid premiums	1,310 00	
By amount paid current expenses 1873	2,605 12	
By amount cash on hand	78 00	
	$6,193 12	$6,193 12

PREMIUMS AWARDED.

FIRST DEPARTMENT.

LIVE STOCK—HORSES.

Animals.	Exhibitors.	Residence.	Premium.
Stallions—Thoroughbred.			
Best three years old and over, Volscian	D. M. Reavis	Chico	$30
Best colt under one year, Jim Adams	D. M. Reavis	Chico	$10
Mares.			
Best three years old and over, Betty Hawkins	M. Tait	Colusa	$20
Stallions—Graded.			
Best three years old and over, Ophir	J. L. King	Chico	$25
Best two years old and over, Blackbird, Jr	D. M. Reavis	Chico	$15
Best one year old and over, Jacinto	B. F. Owens	Chico	$10
Mares.			
Best three years old and over, Kate Signal	J. T. McIntosh	Chico	$20
Best two years old and over, Zone	B. F. Owens	Chico	$10
Best one year old and over, Nellie	D. M. Reavis	Chico	$5
Best colt under one year, without reference to sex, Dove	B. F. Owens	Chico	$1
Stallions—Of all work.			
Best three years old and over, Friday McCracken	Jas. Ellenwood	Marysville	$20
Best two years old and over, Uncle Sam	G. R. Griffith	Chico	$10
Mares.			
Best three years old and over, Puss	Wm. Sharkey	Nord	$15
Stallions—Draft.			
Best three years old and over, Wallace	John Bidwell	Chico	$20

LIVE STOCK—HORSES—Continued.

Animal.	Exhibitor.	Residence.	Premium.
Stallions—Roadsters.			
Best three years old and over, Blackbird	D. M. Reavis	Chico	$20
Best two years old and over, Claus Bloomsbury	G. M. McWain	Marysville	$15
Best gelding, four years old and over, Dan Rice	D. McVickers	Marysville	$20
Mares.			
Best three years old and over, Belle Friday	Jas. Ellenwood	Marysville	$20
Carriage Horses.			
Best matched span carriage horses, owned and used as such by one person, Kate and Nellie	Wm. Sharkey	Nord	$15
Roadster Teams.			
Best double team roadsters, owned and used as such by one person, Polly and Jane	W. Bassett	Chico	$1
Saddle Horses.			
Best saddle horse, Billy	Fred. Stiles	Chico	$1
Colts.			
Best yearling horse colt, Reavis 2d	D. Bidwell	Chico	$1
Best yearling mare colt, Mohave	H. Bay	Chico	$1
Sweepstakes.			
Best stallion of any age, Blackbird	D. M. Reavis	Chico	$2
Best mare of any age, Nellie	P. Wall	Marysville	$

JACKS AND MULES.

Animal.	Exhibitor.	Residence.	Premium.
Best jack, two years old and over, Ringgold	M. V. Patrick	Chico	$1
Best span mules, owned by one person, Jennie Lind and Dolly Varden	F. C. Graves	Olympo	$

CATTLE.

Animal.	Exhibitor.	Residence.	Premium.
Durham Bulls.			
Best three years old and over, Stonewall	D. M. Reavis	Chico	$20
Best two years old, General Grant	H. J. Glenn	Jacinto	$15
Best one year old, 8th Duke Liberty	D. M. Reavis	Chico	$10
Best bull calf, 9th Duke Yuba	G. N. Swezy	Marysville	$10
Cows.			
Best three years old and over, Ione 4th	J. L. Chambers	Chico	$20
Best two years old, Belle of Butte	M. Wick	Oroville	$15
Best one year old, Daisy	G. N. Swezy	Marysville	$10
Best heifer calf, Princess of Yuba	G. N. Swezy	Marysville	$5
Devon Bulls.			
Best three years old and over, Prince Tehama	L. H. D. Lang	Tehama	$20
Best bull calf, Colonel	L. H. D. Lang	Tehama	$10
Devon Cows.			
Best two years old and over, Beauty	L. H. D. Lang	Tehama	$15

GRADED CATTLE.

Animal.	Exhibitor.	Residence.	Premium.
Bulls.			
Best one year old, May Duke	Blevins & Haines	Chico	$15
Best bull calf, Hercules	John Bidwell	Chico	$5
Cows.			
Best three years old and over, Kate	Blevins & Haines	Chico	$10
Best heifer calf, Molly	J. L. Chambers	Chico	$2 50
Sweepstakes.			
Best bull of any age or stock, General Grant	H. J. Glenn	Jacinto	$30
Best cow of any age or stock, Ione Fourth	J. L. Chambers	Chico	$20

SHEEP.

Animal.	Exhibitor.	Residence.	Premium.
Best fine wool buck, Dickey	J. Bidwell	Chico	$10
Best fine wool ewe	J. Bidwell	Chico	$10
Best long wool ewe	John Guill	Chico	$10
Best medium wool buck	J. R. Bennett	Chico	$10
Best medium wool ewe	J. R. Bennett	Chico	$10
Sweepstakes.			
Best buck of any kind, Dickey	John Bidwell	Chico	$20
Best ewe of any kind	John Bidwell	Chico	$15

SWINE.

Animal.	Exhibitor.	Residence.	Premium.
Best boar of any breed	J. H. Guill	Chico	$10
Best sow of any breed	William Sharkey	Nord	$10
Best pair of pigs	John Bidwell	Chico	$5

POULTRY.

Animal.	Exhibitor.	Residence.	Premium.
Best pair black Spanish	R. Donovan	Chico	$3
Best pair black Bramahs	J. Bidwell	Chico	$3
Best pair light Bramahs	J. J. Vukler	Chico	$3
Best pair ducks	John Bidwell	Chico	$3
Best pair turkeys	R. Donovan	Chico	$3

SECOND DEPARTMENT.

CLASSES I, II, III, AND IV.

Article.	Exhibitor.	Residence.	Premium.
Best display agricultural machines by any one house	Jones, Reilly & Co.	Chico	$20
Iron gang harrow	John O'Brien	San Francisco	$5
Wood's mower	Jones, Reilly & Co.	Chico	$10
Broadcast sower	Jones, Reilly & Co.	Chico	$10
Wheat drill	C. L. Stilson & Co.	Chico	$10
Best seed sower and cultivator	C. L. Stilson & Co.	Chico	$10
Best revolving hay rake	C. L. Stilson & Co.	Chico	Spc'l ment'n
Best feed cutter	C. L. Stilson & Co.	Chico	Spc'l ment'n
Best farm gate	Elijah Hickman	Colusa County	$5
Best fanning mill	Jones, Reilly & Co.	Chico	$5
Best grist mill	Jones, Reilly & Co.	Chico	$5
Best cider mill	Jones, Reilly & Co.	Chico	Spc'l ment'n
Best beehive	Robert Donovan	Chico	$5
Best clotheshorse	L. H. Burket	Chico	$5
Best clothes wringer	Jones, Reilly & Co.	Chico	Spc'l ment'n
Best clothes washer	John Rickey	Marysville	$5

CLASS V—PLOWS.

Best two-gang plow	C. L. Stilson & Co.	Chico	$10
Best subsoil plow	C. L. Stilson & Co.	Chico	
Best plow for general purposes	C. L. Stilson & Co.	Chico	
Best three-gang plow	Jones, Reilly & Co.	Chico	$10

CLASS VI—VEHICLES.

Best farm wagon	Sherwood & Turner	Chico	$10
Best wagon brake	Sherwood & Turner	Chico	$5

THIRD DEPARTMENT.

CLASS I.

Article.	Exhibitor.	Residence.	Premium.
Best foot mats	Mrs. G. W. Calby	Nord	$2 50
Best ten yards of rag carpet	Mrs. E. D. Mickey	Chico	$5
Best exhibit of stocking yarn	Mrs. W. A. Twitchell	Chico	$3
Best display of drygoods	Zinsler & Brozler	Chico	$20

CLASS II.

Article.	Exhibitor.	Residence.	Premium.
Best set of farm harness	C. C. Maltby	Chico	$10
Best pair of fine boots	J. Peal	Chico	$5
Best pair of coarse boots	J. Peal	Chico	$5

CLASS III.

Article.	Exhibitor.	Residence.	Premium.
Best specimen of wax flowers	Miss Annie B. Eckert	Chico	$2 50
Best worked quilt	Mrs. O. D. Morse	Chico	Spc'l men'tn
Best patchwork quilt	Mrs. Jno. Shannon	Chico	$5
Best silk quilt	Mrs. Wm. Thorp	Chico	$5
Best worsted quilt	Mrs. John Guill	Chico	$5
Best specimen braid work	Mrs. John Guill	Chico	$2 50
Best embroidered handkerchief	Mrs. John Guill	Chico	$2 50
Best exhibit of boys' clothing	Mrs. J. P. Helphenstine	Chico	$10
Best display of millinery	Mrs. J. M. Pearson	Chico	$10
Best embroidered lace collars	Mrs. M. D. Brown	Chico	$2 50
Best patchwork quilt	Miss Birdie Bernard	Chico	$2 50
Best child's afghan	Mrs. D. M. Reavis	Chico	$5
Best chair seat and back	Mrs. A. D. Smith	Marysville	$2 50
Best pillow slips	May Wadkins	Chico	$2 50

FOURTH DEPARTMENT.

CLASS I.

Article.	Exhibitor.	Residence.	Premium.
Best display of general hardware	Jones, Reilly & Co.	Chico	
Display of silverware	Hibberd & Somers	Chico	$5

CLASS II.

Article.	Exhibitor.	Residence.	Premium.
Best display of stoves	C. L. Stilson & Co.	Chico	$10

CLASS III.

Article.	Exhibitor.	Residence.	Premium.
Best display of furniture	Lucas & Walraven.	Chico	$10

CLASS IV.

Article.	Exhibitor.	Residence.	Premium.
Best exhibit of doors	C. Walker	Chico	$10

CLASS V.

Article.	Exhibitor.	Residence.	Premium.
Best display of soap	Mrs. J. B. Swearengen	Chico	$5

CLASS VI.

Article.	Exhibitor.	Residence.	Premium.
Best display of crockery and glassware	J. F. Newman	Chico	$10

FIFTH DEPARTMENT.

CLASS I.

Article.	Exhibitor.	Residence.	Premium.
Best sack of wheat	Wm. Van Woert	Chico	$5
Best sack of flour	John Bidwell	Chico	$5
Best sack of barley	John Bidwell	Chico	$2 50
Best sack of oats	John Bidwell	Chico	$2 50
Best exhibit of corn	R. C. Rase	Chico	$5
Best can of lard	Mrs. Wm. Thorp	Chico	$2 50
Best alfalfa seed	R. McEnespy	Chico	$2 50

CLASS II.

Article.	Exhibitor.	Residence.	Premium.
Best tomatoes and other vegetables	John Bidwell	Chico	$8
Best turnips and other vegetables	R. C. Rase	Chico	$8
Best collection of vegetables	John Bidwell	Chico	$5
Best collection of garden seeds	F. Phillips	Chico	$5

CLASS III.

Article.	Exhibitor.	Residence.	Premium.
Best five rolls of butter	Mrs. J. P. Helphenstine	Chico	$5

CLASS IV.

Article.	Exhibitor.	Residence.	Premium.
Best domestic bread	Mrs. J. C. Mandeville	Chico	$2
Best exhibit of pastry	Mrs. E. D. Silsby	Chico	$2 50
Best frosted cake	Mrs. Steinberger	Chico	$2 50

CLASS V.

Article.	Exhibitor.	Residence.	Premium.
Pickled figs and canned peaches	Mrs. Dan. Bidwell	Chico	$5
Best variety of jellies	Mrs. J. B. Swearenger	Chico	$5
Best variety of preserved fruits	Mrs. C. L. Stilson	Chico	$5
Best variety of persimmons	Mrs. J. P. Helphenstine	Chico	$5
Best ten pounds of honey	R. Donovan	Chico	$5
Best hive Italian bees	R. Donovan	Chico	

SIXTH DEPARTMENT.

CLASS I.

Article.	Exhibitor.	Residence.	Premium.
Best collection of apples	Wm. Boness	Chico	$10
Best collection of pears	Wm. Boness	Chico	$10
Best collection of peaches	Wm. Boness	Chico	$5
Best collection of plums	Samuel Crose	Chico	$5
Best collection of foreign grapes	L. R. Moak	Chico	$10
Best single bunch of foreign grapes	Shelden Gray	Chico	$3
Best single bunch California grapes	L. R. Moak	Chico	$3
Best collection of wine grapes	L. R. Moak	Chico	$10
Best collection of all the various kinds of fruit	John Bidwell	Chico	$10
Best California figs	L. R. Moak	Chico	$3
Best pomegranates	Samuel Crose	Chico	$3

CLASS II.

Article.	Exhibitor.	Residence.	Premium.
Best display dried fruit	W. Boness	Chico	$10
Best display cultivated nuts	L. R. Moak	Chico	$5
Best five pounds raisins	John Bidwell	Chico	$5

SEVENTH DEPARTMENT.

CLASS II.

Article.	Exhibitor.	Residence.	Premium.
Best vinegar	L. R. Moak	Chico	$3
Best red wine	F. Phillips	Chico	$3
Best currant wine	Mrs. C. L. Stilson	Chico	$3
Best blackberry cordial	Mrs. C. L. Stilson	Chico	$3
Best white wine	Shelden Gray	Chico	$3

EIGHTH DEPARTMENT.

CLASS I.

Article.	Exhibitor.	Residence.	Premium.
Best water colored painting	Mrs. D. Bidwell	Chico	$5
Best crayon drawings	Master J. Crosette	Oroville	$5
Best colored drawings	Miss Ada Wedkin	Chico	$5
Best specimens penmanship	R. H. Allen	Chico	$5
Best pastelle painting	Miss McEnespy	Chico	$2 50
Best oscutal painting	Miss McEnespy	Chico	$2 50
Best pastelle col'd painting	Miss Carrie Arents	Chico	$5
Specimen penmanship, showing likeness of Abraham Lincoln	Miss A. Copland	Chico	$5

CLASS II.

Article.	Exhibitor.	Residence.	Premium.
Best exhibit of sign painting	Harry Bedford	Chico	$5

CLASS III.

Article.	Exhibitor.	Residence.	Premium.
Statuary.			
A portrait bust of Italian marble.	Mrs. G. B. Cady	Chico	$10

MISCELLANEOUS DEPARTMENT.

Article.	Exhibitor.	Residence.	Premium.
Fine collection of tropical and flowering plants, in bloom	Mrs. John Bidwell	Chico	$20 00
Best tomato catsup	Mrs. R. McEnespy	Chico	$2 50
Best collection natural flowers	Mrs. A. F. Blood	Chico	$2 50
One worsted wreath	Miss Kate Morse	Chico	$2 50
One hair wreath	Miss Jennie Lee	Chico	$2 50
One comb and brush bag	Miss Lizzie Cren	Chico	$2 50
Fancy baskets	Mrs. M. D. Brown	Chico	$2 50
Five baskets crochet work	Mrs. Wm. Sharkey	Nord	$2 50
Specimen crochet work	Miss Jessie Hickok	Chico	$2 50
Worsted bouquet	Miss Mary Gardner	Chico	$2 50
Agricultural wreath	Miss Mattie Phillips.	Chico	$2 50
One bunch flax thread, made in the East by a lady sixty-five years of age, with one arm; exhibited by	R. McEnespy	Chico	$2 50
One case candies, home made	E. A. Warren	Chico	$5 00
Trout lines and nest artificial mice	Willie Henderson	Chico	$2 50
Patchwork spread	Miss Mattie Shaw	Chico	$2 50
Can lard	William Thorp	Chico	$2 50

TRANSACTIONS

OF THE

SISKIYOU COUNTY AGRICULTURAL SOCIETY,

FOR

THE YEAR 1873.

REPORT.

YREKA, November 22d, 1873.

To the honorable the State Board of Agriculture:

GENTLEMEN: Inclosed you will find the transactions of the Siskiyou Agricultural Society for the year eighteen hundred and seventy-three. The showing, you will perceive, is a good one. The institution is in a flourishing condition, notwithstanding the fact that many of our farmers decline showing at it. Yet the exhibition of stock this year would do credit to any Fair—the animals being prize ones of their kind. Our climate is so varied that it is a difficult thing for the society to hold a Fair suited to all places. This year, during the exhibition, Scott Valley was in the height of thrashing, consequently but few people attended.

JAMES QUINN,
Secretary.

FINANCIAL REPORT.

Items.	Amount.
Receipts.	
State aid	$2,000 00
Cash on hand	625 68
Membership	510 00
Licensed peddlers	20 00
Gate money	168 00
Bar receipts	555 20
Ball	161 25
Saddles	72 00
Pools	88 95
Rent	125 00
Entries—stock	126 25
Entries—races	650 00
Interest	45 00
Entries colt stake, 1874	180 00
Total	$5,327 33
Expenditures.	
R. Nixon, printing	$52 00
Yreka Gas Co	5 00
J. Martin, hay	71 10
L. Swain, material	43 00
J. Davis, goods	30 50
J. Irwin, labor	6 00
Truitt & Young, labor	40 00
J. Pashburg, merchandise	48 25
A. Winckler, merchandise	25 95
Raynes & Pyle, merchandise	14 64
Radford & Shultz, merchandise	4 25
F. Ringe, merchandise	47 00
H. Cheld, merchandise	12 00
J. Uerlings, labor	5 00
Guilbert, merchandise	56 00
Turn Verein, rent	13 00
E. V. Brown, lumber	1 20
Lamb & Co., lumber	17 39
L. Monet, labor	10 00
C. Breton, merchandise	9 00
Cleland & Walbridge, merchandise	32 00

Items.	Amount.
Yreka Union, printing	$51 00
C. Iunker, merchandise	9 00
Wm. Cooley, labor	10 00
W. R. Oberlin, straw	6 00
C. Barcelaux, labor	35 00
McConnell & McManus, merchandise	121 90
T. Young, merchandise	17 00
C. Enos, labor	94 00
C. Peters, lager	14 50
John Van Ordn, labor	12 00
H. Truitt, music	70 00
Knights & Co., merchandise	6 60
Lawton & Steward, labor	10 00
A. Hawkins, labor	20 00
E. H. Autenrieth, labor	20 00
E. C. Spannaus, straw	5 00
J. Quinn, labor	20 00
R. Redding, premium	45 00
I. A. Reynolds, premium	20 00
J. Quinn, premium	55 00
W. McConnell, premium	40 00
E. Flitner, premium	10 00
B. R. Morris, premium	20 00
J. Keppler, premium	10 00
G. K. Godfrey, premium	10 00
George Baker, premium	15 00
H. Davis, premium	10 00
I. S. Matthews, premium	10 00
Quinn & Connell, premium	95 00
J. Davis, premium	10 00
Davidson Kenyon, premium	80 00
J. Davidson, premium	10 00
W. B. Miller, premium	30 00
Mary Nixon, premium	2 00
Lizzie Nixon, premium	1 00
J. Vance, premium	5 00
Mrs. Nordheim, premium	3 50
Mrs. Bisbee, premium	8 50
J. Lang, premium	5 00
Mrs. J. Davis, premium	9 50
Mrs. Hilt, premium	56 50
Mrs. H. L. Davis, premium	17 50
S. C. Moores, premium	5 00
Ella Chase, premium	1 00
Mrs. J. Vance, premium	5 00
Mrs. J. Martin, premium	2 00
Mrs. A. M. Rosborough, premium	6 00
Mrs. Anderson, premium	5 00
Mrs. L. Autenrieth, premium	2 50

Items.	Amount.
Mrs. S. M. Farren, premium	$2 50
Mrs. William Hutchinson, premium	5 00
Lizzie Brown, premium	5 00
W. J. Evans, premium	5 00
L. R. Warren, premium	5 00
Mrs. C. Hammond, premium	5 00
Mrs. David Horn, premium	1 50
Mary Shaw, premium	1 50
Kate Iunker, premium	5 00
Mrs. E. Wadsworth, premium	5 00
Belle Skinner, premium	2 00
Minnie Winckler, premium	2 50
Mrs. Buckmaster, premium	1 00
Mrs. F. J. King, premium	7 00
Mrs. Iffland, premium	1 00
Betty Pashburg, premium	2 00
Mrs. Henry Repp, premium	2 00
Mary Stein, premium	14 00
Nettie King, premium	1 00
Lena Bisbee, premium	3 50
Sophie Winckler, premium	1 00
Katie Remme, premium	2 00
Lottie Hanford, premium	2 00
Dora Iunker, premium	2 50
Annie Stimmel, premium	1 00
Laura Fried, premium	7 25
Carrie Swan, premium	1 00
Adela Winckler, premium	1 00
Pearl Brown, premium	1 50
Aggie Vance, premium	1 00
P. G. Strickland, premium	10 00
E. Reichman, premium	5 00
Mrs. Fellows, premium	2 50
Willie King, premium	1 50
J. R. Kenyon, premium	2 50
J. Davis, premium	5 00
C. Schlicht, premium	2 50
H. L. Davis, premium	5 00
J. Miller, premium	5 00
W. J. Evans, premium	5 00
Lolas Brothers, premium	5 00
D. B. Warren, premium	5 50
R. Nixon, premium	5 00
Mrs. C. Haight, premium	5 00
S. B. Buckmaster, premium	5 00
B. F. Smith, premium	10 00
L. Swan, premium	20 00
James Ranous, premium	4 00
C. H. Pyle, premium	3 00
J. Quinn, premium	9 00

Items.	Amount.
L. Huseman, merchandise	$44 50
J. Quinn, salary	50 00
J. Lang, premium	5 95
J. Knapp, labor	9 00
Raynes & Pyle, merchandise	8 15
J. Vance, money advanced	2 00
J. Celand, old lumber bill	62 75
J. Maxwell, old lumber bill	22 00
M. Pipes, labor	25 00
J. M. Strauser, labor	7 50
E. Steele, water right	50 00
W. Parks, water right	50 00
A. Hawkins, taxes	5 00
C. D. Smith, city taxes	2 50
L. Swan, labor	17 50
W. Townsend, hay	16 42
Pellett & Fisher, pitchers	30 50
E. & H. Wadsworth, freight	4 15
State & Co., taxes	16 00
E. & H. Wadsworth, freight	25 40
Federal licenses for 1872	13 45
October first, purses this day	441 00
October second, purse this day	517 50
October fourth, purse this day	607 50
F. Ringe, error in his bill	10 00
A. Lee, labor	214 71
Balance on hand	1,186 07
	$5,327 33

RECAPITULATION.

EXPENDITURES.

Items.	Amount.
General expenses	$3,369 56
Premiums paid	771 70
Balance on hand	1,186 07
	$5,327 33

PREMIUMS AWARDED.

CLASS I—THOROUGHBRED HORSES.

Animal.	Exhibitor.	Premium.
Gladiator, by Belmont, dam Liz. Givens	Robert Redding	$25
Mary Tompkins, by Norfolk, dam Alamode.	I. A. Reynolds	$20
Families.		
Mare Mary and colts Hamlet, Rochester, and sucking colt	Perry Woods	$20
Mare Murphy filly with colts Queen of Hearts, Jenny Lind, and Gobbler	Jake Keppler	Diploma.

CLASS II—GRADED HORSES.

Article.	Exhibitor.	Premium.
Kirby Smith, eight years, by Gladiator, dam Kate Dixie	R. B. Morris	$20
Rochester, four years, by Gladiator	Perry Woods	Diploma.
Gobbler, one year, by Lodi, dam Murphy filly	Jake Keppler	$5
Patrick Henry, six and a half months, by Jack Minor, dam Julia	James Quinn	$5
Ada, six years, by Gladiator, dam Louisa	William McConnell	$15
Lard, by Gladiator, dam unknown	Robert Redding	$5
Queen of Hearts, three years, by Gladiator, dam Murphy filly	E. Flitner	$10
Jenny Lind, two years, by Lodi, dam Murphy filly	Jake Keppler	$5
Lady Clara, five months, by Norfolk, dam Hunkadora	I. A. Reynolds	Diploma.

CLASS III—HORSES OF ALL WORK.

Animal.	Exhibitor.	Premium.
Godwin, three years, by Keokuk, dam unknown	G. K. Godfrey	$10
Julia, seven years, by Vermont, dam Julia Tolman	James Quinn	

CLASS IV—DRAFT HORSES.

Animal.	Exhibitor.	Premium.
Godwin, by Keokuk, dam unknown	G. K. Godfrey	Diploma.
Fannie, with colt	George Baker	$10
Kate, four years, with colt	George Baker	Diploma.
Sucking colt, four months, by Clydesdale stallion Oxford, dam Fannie	George Baker	$5
Sucking colt, four months, by Clydesdale stallion Oxford, dam Susie	George Baker	Diploma.

CLASS V—ROADSTERS.

Animal.	Exhibitor.	Premium.
Red Maria, eight years, by Keokuk	Robert Redding	$15
Frank, eight years, by Keokuk	William McConnell	$15
Defiance, by Keokuk	Jesse Davis	Special premium.
Brick Pomeroy, seven years, by Vermont	J. N. T. Miller	Special premium.

CLASS VI—ROADSTER TEAMS.

Animal.	Exhibitor.	Premium.
Frank and Sam	William McConnell	$10
Pelham and Gladiator	Sam. Jackson	Second premium.

CLASS IX—COLTS.

Animal.	Exhibitor.	Premium.
Frank Bartlett, two years, by Frank Tolman.	I. S. Mathews	$10

CLASS X—FARM HORSES.

Animal.	Exhibitor.	Premium.
Pluck, three years; Frank, three years	H. L. Davis	$10

CATTLE.

Animal.	Exhibitor.	Premium.
Thoroughbreds—Ayrshires.		
Bull, Col. Lyman, three years old	Quinn & McConnell	$20
Bull, F. D. Curtis, one year old	Quinn & McConnell	$10
Bull calf, Capt. Jack	Quinn & McConnell	$5
Cow, Janet Fourth, four years old	Quinn & McConnell	$20
Cow, Belle of Siskiyou, one year old	Quinn & McConnell	$10
Heifer calf, Beck Moore	Quinn & McConnell	$5
Devons.		
Bull, Third Duke of Devon, five years old	Davidson & Kenyon	$25
Bull calf, Siskiyou, seven months old	Davidson & Kenyon	$5
Cow, Daisy, four years old	Davidson & Kenyon	$20
Heifer, Rabbit, two years	Davidson & Kenyon	$15
Bull calf, Durbenham, one year old	Davidson & Kenyon	$10
Heifer calf, Alamode	Davidson & Kenyon	$5
Herd of cattle of any one breed, not less than five, owned in the county—Thoroughbreds.		
Bull, Col. Lyman; bull, F. D. Curtis; bull, Capt. Jack; cow, Janet Fourth; cow, Harriet Clancey; cow, Rose Fourth; heifer, Beck Moore	Quinn & McConnell	$20
Graded.		
Spotted cow, Lily, six years old	Jesse L. Davis	$10
Sweepstakes.		
Best cow of any age or stock: Cherry, Devon and Durham, eight years old	Kenyon	Silver pitcher, $25
Best bull and five of his calves under one year old: Third Duke of Devon and five of his calves	Davidson	Silver pitcher, $25

Judges—J. R. Cameron, C. F. Hammond, and David Horn.

SHEEP.

Animal.	Exhibitor.	Premium.
Merinos.		
Ram, Pioneer, three years old.	Jas. Quinn	$10
Two ewes, Lucy and Peggy	Jas. Quinn	$10
Ram, Sam, under two years old	Jas. Quinn	$5
Ram, Dick, seven years old	Hiram Richardson	Special premium.
Sweepstakes.		
Best pen of five sheep of any age or breed	Jas. Quinn	$15

Judges—J. R. Kenyon, J. Wood, and John Wells.

ANGORA GOATS.

Animal.	Exhibitor.	Premium.
Graded buck, seven months old; also a graded ewe, same age; no pedigree	R. I. Linton	Special premium.

SWINE—BERKSHIRES.

Animal.	Exhibitor.	Premium.
Boar, B. Young, two years old	Jas. A. Davidson	$10
Boar pig	W. B. Miller	$5
One sow and seven pigs	W. B. Miller	$15
Sow	W. B. Miller	$10
Essex boar and sow	Jas. A. Davidson	Sp. premium rec'd

Judges—I. S. Mathews, Jesse L. Davis, and Sam. Jackson.

POULTRY.

Animal.	Exhibitor.	Premium.
Best exhibit White Dorkings	Jas. Quinn	$3
Best exhibit Black Spanish	Jas. Quinn	$3
Best exhibit Dark Bramahs	Jas. Quinn	$3
Best exhibit Light Bramahs	C. H. Pyle	$3
Best exhibit White Cochins, Silver Spangled and Golden Spangled Hamburgs, and Buff Cochins	James Ranous	$4

VEHICLES.

Article.	Exhibitor.	Premium.
Top buggy	L. Swan	$10
Lumber wagon for general purposes	L. Swan	$10
Two-seated family wagon with brake	L. Swan	Diploma.
Open buggy, without top	L. Swan	Special prem. rec.

FINE ARTS—DRAWINGS, PAINTINGS, ETC.

Article.	Exhibitor.	Premium.
Three oil paintings	Mrs. A. M. Rosborough.	Diploma and $5
Natural talent as an artist	B. F. Smith	$10
Penmanship	S. B. Buckmaster	Diploma.
Pen drawing	S. B. Buckmaster	$5
Pencil drawing	Mrs. Cornelius Haight.	$5
Best display of printing	Robert Nixon	$5

FRUITS, VEGETABLES, AND GRAIN.

Article.	Exhibitor.	Premium.
First premium for apples	Mrs. N. E. Hilt	$10
First premium for pears	Mrs. N. E. Hilt	$5
First premium for grapes	Mrs. N. E. Hilt	$5
First premium for beans	Mrs. N. E. Hilt	$5
First premium for hops	Mrs. N. E. Hilt	$5
Second premium for apples	Mrs. H. L. Davis	$7 50
Second premium for pears	D. B. Warren	$3
First premium for pumpkins	D. B. Warren	$2 50
First premium for peaches	Solas Brothers	$5
First premium for plums	James Vance	$3
First premium for sack of wheat	W. J. Evans	$5
First premium for sack of barley	John Miller	$5
First premium for sack of oats	H. L. Davis	$5
Second premium for sack of wheat	Charles Schlicht	$2 50
First premium for potatoes	Jesse Davis	$5
First premium for beets	J. R. Kenyon	$2 50
First premium on squashes	S. C. Moores	$2 50
Special premium for Hubbard squash	Willie King	$1 50
Special premium for exhibit of cauliflowers	Mrs. Fellows	$2 50
First premium for sack of flour	E. Reichman	$5
First premium for buckskin gloves	P. G. Strickland	$5
Special premium for tanned dog and buckskin	P. G. Strickland	$5

CHILDREN'S DEPARTMENT.

PLAIN SEWING AND COTTON EMBROIDERY.

Article.	Exhibitor.	Premium.
Cotton embroidery	Aggie Vance	$1
Braid work	Adala Winckler	$1
Plain sewing	Pearl Brown	$1 50
Plain sewing	Lena Bisbee	$1 50
Patchwork	Carrie Swan	$1
Fancy work.		
Largest and best display, by one person, in this department	Louisa Fried	$5
Crochet collar	Louisa Fried	$1 25
Tidy	Louisa Fried	Diploma.
Worsted daisy tidy	Louisa Fried	$1
Crochet tidy	Annie Stimmel	$1
Crochet tidy	Sarah Stine	Diploma.
Lace	Mary Jane Davis	Diploma.
Tidy and lace	Emma Schlagal	Diploma.
Worsted embroidery	Dora Iunker	$2 50
Worsted embroidered sofa cushion	Lizzie Nixon	$1
Worsted daisy tidies	Mary Nixon	$2
Set table mats	Lotty Hanford	$2
Bead work	Katie Remme	$2
Bead basket	Sophia Winckler	$1
Embroidered napkin	Lena Bisbee	$2
Lamp mat	Nettie King	$1

LADIES' DEPARTMENT.

FANCY WORK.

Article.	Exhibitor.	Premium.
Best exhibit and greatest number of articles in this class	Miss Mary Stine	$10
Perforated cardboard cross	Miss Mary Stine	$2
Knitted sofa cushion	Miss Mary Stine	Diploma.
Embroidered tidy	Miss Mary Stine	$2
Crochet tidy	Mrs. Henry Repp	$2
Canvas tidy	Mrs. Henry Repp	Diploma.
Crochet pincushion	Miss Betty Pashburg	$2
Crochet lace and insertion	Miss Betty Pashburg	Diploma.
Knitted lace, cotton	Miss Betty Pashburg	Diploma.

FANCY WORK—Continued.

Article.	Exhibitor.	Premium.
Silk embroidered pincushion	Mrs. J. Iffland	$1
Lamp shade	Mrs. J. Iffland	Diploma.
Knitted tidy	Mrs. J. Iffland	Diploma.
Silk embroidery	Mrs. F. J. King	$5
Bouquet of dried California grasses	Mrs. F. J. King	$2
Set lamp mats	Mrs. J. Buckmaster	$1
Embroidered canvas tidy	Mrs. J. Buckmaster	Diploma.
Worsted sofa cushion	Mrs. Nordheim	$1
Embroidered pincushion	Mrs. Wm. Bisbee	$1
Lamp veil	Mrs. Wm. Bisbee	Diploma.
Embroidered wreath	Miss Minnie Winckler	$2 50
Autumn wreath	Mrs. D. Merrick	Diploma.
Shell work	D. B. Warren	Diploma.
Crochet tidy	Miss Sophie Remme	Diploma.
Worsted crochet tidy	Mrs. Cornelius Haight	Diploma.
Canvas tidy	Mrs. L. R. Warren	Diploma.
Crochet worsted sofa cushion	Mrs. L. R. Warren	Diploma.
One pair wire brackets	Belle Skinner	Hon. mention.
Plant in hanging basket	Belle Skinner	$2
Wax flowers and cross	Mrs. E. Wadsworth	$5
Wall basket	Helen Stimmel	Diploma.
Watch pocket	Mrs. S. Autenreith	Diploma.
Plain sewing and braiding	Katy Iunker	$5
Tucking, by hand	Mary Shaw	$1 50
Machine tucking	Mrs. D. Horn	$1 50
Silk braiding	Mrs. Chas. Hammond	$2 50
Machine work	Mrs. Chas. Hammond	$2 50
Silk quilt	Mrs. L. R. Warren	$5
Worsted quilt	Mrs. W. J. Evans	$5
Worked quilt	Mrs. Lizzie Brown	$5
Patchwork quilt	Mrs. Wm. Hutchinson	$5
Machine braiding	Mrs. S. M. Farren	$2 50
Work basket	Mrs. S. Autenreith	$2 50
Pair woolen stockings	Mrs. N. E. Hilt	Hon. mention.
Hearth rug	Mrs. N. E. Hilt	$3

Mrs. Anderson, aged sixty-four years, was awarded, last year, a premium of five dollars on a bedquilt, which, by mistake, was not paid. Your committee would recommend that said premium be paid.

FRUITS, JELLIES, WINES, ETC.

Article.	Exhibitor.	Premium.
Best currant jelly	Mrs. Jesse Davis	$1
Plum jelly	Mrs. Jesse Davis	Diploma.
Fresh canned peaches	Mrs. Jesse Davis	Diploma.
Fresh pears, canned	Mrs. Jesse Davis	$2
Best crab-apple jelly	Mrs. A. M. Rosborough	$1
Canned tomatoes	Mrs. A. M. Rosborough	Diploma.
Crab-apple jelly	Mrs. Jacob Martin	Diploma.
Fresh peaches, canned	Mrs. Jacob Martin	$2
Fresh pears, canned	Mrs. Jacob Martin	Diploma.
Best plum jelly	Mrs. Wm. Bisbee	$1
Grape jelly	Mrs. Wm. Bisbee	Diploma.
Pickled pears	Mrs. Wm. Bisbee	$1
Canned plums	Mrs. Wm. Bisbee	$2

FRUITS, JELLIES, WINES, ETC.—Continued.

Article.	Exhibitor.	Premium.
Best grape jelly	Mrs. N. E. Hilt	$1
Best peach preserves	Mrs. N. E. Hilt	$2
Best ground cherry preserves	Mrs. N. E. Hilt	$2
Currant wine	Mrs. N. E. Hilt	Diploma.
Best blackberry wine	Mrs. N. E. Hilt	$2 50
Best grape wine	Mrs. N. E. Hilt	$2 50
Best raspberry jelly	Mrs. H. L. Davis	$1
Canned tomatoes	Mrs. H. L. Davis	$2
Best tomato catchup	Mrs. H. L. Davis	$2
Best tomato preserves	Mrs. James Vance	$2
Pickled peaches	Miss Ella Chase	$1
Best currant wine	S. C. Moores	$2 50

DRIED FRUIT, BREAD, ETC.

Article.	Exhibitor.	Premium.
Dried tomatoes	Mrs. H. L. Davis	$5
Best and largest display of dried fruits	Mrs. N. E. Hilt	$5
Salt rising bread	Mrs. N. E. Hilt	$1
Best display of honey	Mrs. N. E. Hilt	$5
Boiled cider	Mrs. N. E. Hilt	$2 50
Best yeast bread	Mrs. Jesse Davis	$1
Best biscuit	Mrs. Jesse Davis	$1
Best cake	Mrs. Jesse Davis	$2
Best vinegar	Mrs. Jesse Davis	$2 50
Best crackers	Joseph Lang	$2 50
Best Jenny Lind cakes	Joseph Lang	$2 50

MISCELLANEOUS.

Article.	Exhibitor.	Premium.
Best display of house plants	Mrs. Wm. Bisbee	$2 50
Display of cut flowers	Mrs. Wm. Bisbee	$1
Finest fuschia	Mrs. Nordheim	$2 50
Best display of cut flowers	Mrs. B. F. Meyers	Hon. mention and diploma.
Best display of horseshoes	James Vance	$5

ADDRESS.

BY HON. WILLIAM IRWIN.

LADIES AND GENTLEMEN: Pursuant to a request of your President, James Vance, Esq., I appear before you to deliver a brief address. I cannot, however, conceal from myself, nor can I hope to conceal from you, that, in doing so, I am out of my place. The Agricultural Society should be a practical institution—a legitimate development, a natural outgrowth of this practical age. Everything connected with it—all its accessories as well as its essentials—should be of a practical character.

The prime, and, in fact, the only object of an Agricultural Fair, as I understand it, is to impart practical knowledge on the methods of creating material wealth. History is said to be philosophy teaching by examples. An Agricultural Fair teaches the laws of production by exhibiting what has already been produced. The farmer's knowledge of the laws of nature, as they apply to production, is embodied in his crops—in his fields of wheat and barley, rye and corn; in his meadows of timothy, clover, redtop and other grasses; in his patches of potatoes, turnips, beans, and squashes; in his stables of horses, herds of cattle, stocks of sheep, and droves of hogs. In these are reproduced in visible, tangible, material forms, his knowledge of the intangible, invisible, but ever present and ever acting laws of Nature, which govern production.

How to prepare the soil for the seed; when to sow and plant; in what particular crop to cultivate each field—all these and many other points must be known to the cultivator of the soil, if he would be successful in his vocation. But this knowledge, so wide in range and varied in character, and yet absolutely indispensable to the development of the agricultural resources of a country, can be obtained only from experience. It does not come by intuition; it cannot be evolved by any effort of the reflective or reasoning faculties; it exists, if it exist at all, as the result of experiments actually made.

While it is undoubtedly true that the general laws which govern agricultural production are the same throughout the world, it is equally true that these laws are so modified by soil, climate, and other circumstances, that a mode of tillage which would prove uniformly successful in one country, might be as uniformly attended by failure in another. And what is true in this respect, in relation to agriculture, will be found to hold equally in relation to horticulture, stock breeding, wool growing, or any other branch or department of production to which the husbandman may turn his attention. Hence the absolute necessity for special knowledge on the part of those who engage in these pursuits, derived from experiments made in the particular localities where the operations are to be carried on.

What the wheat grower, for example, needs to know, is not how the best crops of wheat—those of the most perfect grain, and the largest in yield—can be produced in England, France, or Russia; in New York, Ohio, or Wisconsin, but how such crops can be produced here in our own valleys. The knowledge which our horticulturists and viniculturists require, is not what fruits do best in New Jersey, Ohio, and Tennessee, nor what species of grapes are best adapted to the soils and climates of France, Spain, and Italy, but what fruits and grapes can be cultivated successfully, and the most profitably, here. The knowledge which will be of special service to the wool grower, is not a knowledge of the different breeds of sheep that are bred in the different countries of Europe, or in the various States of the Atlantic seaboard and the Mississippi Valley, and the treatment which each requires in these several localities, but a knowledge of what particular kinds will do best in California, and of the particular treatment they require in this climate.

It is to promote this specific, this special knowledge—this knowledge which can exist only as the result of experiments made here—that this society has been organized, and this Fair is held. Were I an agriculturist, a horticulturist, a viniculturist, or a stock raiser, and did I furnish in the superiority of the products of my farm, the proof that I was the fortunate possessor of secrets unknown to others, I might with propriety come before you in the character of an instructor.

If I could tell the members of this society how they could keep smut or rust from their wheat; how they could raise larger and better potatoes; or how to mingle and cross strains of blood so as to produce Flora Temples, Dexters, Goldsmith Maids, and Occidents, I would feel that I had knowledge which they ought to possess, and that I would not be wasting their time while endeavoring to impart it to them. But, though it involve a confession of my own ignorance, I am constrained to acknowledge my utter lack of this kind of knowledge. I have no experience which will throw light on these subjects, where light derived from experience is so much needed. To be frank, I feel out of my element in attempting to address an agricultural society. I do so because I am conscious of my deficiency in that kind of knowledge which agricultural societies are intended specially to promote. As already stated, they are practical institutions, an outgrowth or development of a practical age, and are intended as a means to diffuse practical information on the methods of production.

But, ladies and gentlemen of the Siskiyou County Agricultural Society, as I have permitted myself to be inveigled into a position where an address is expected of me, and, as I am not capable of delivering the kind of address I would like to, and which I think ought to be delivered on such an occasion, I must talk on such subjects as I can. I ask your attention, therefore, for a brief period, while I advert to some of the effects which have followed the introduction of machinery, and indicate others which are likely to result from its more general employment in agricultural labor.

The object of all labor is to create something which will contribute to the supply of human wants. As it would be impossible to enumerate all the wants, natural or artificial, of civilized man, so it is impossible to point out all the ends to which human labor is directed. We can only say that every act of human labor has for its grand final object the satisfaction of some natural or artificial want of man.

Uncivilized man has but few wants. These few are simple and easily supplied. He is but little above the brute, and his wants are chiefly those which contribute to the support of mere animal existence. But as man leaves the uncivilized state and becomes a civilized being, his wants rapidly multiply. The crude, unskilled labor of his own hands, no longer suffices to supply them. They have become both greater in number, and more refined in character. A new tax is now levied on his resources. To mere physical exertion, he must add another element—the element of skill. As he recedes farther and farther from barbarism, and attains to still higher stages of civilization, his wants still farther increase in number, and become still more refined in character. And as this process goes on from father to son—from generation to generation—heavier, and ever increasing exactions are made on his labor and skill.

Under the pressure of this emergency, which is as omnipresent as Deity, and as remorseless as fate, it is but natural that he should commence to devise methods for satisfying these wants in an easier, speedier, and cheaper manner. At this point, inventions commence; here machinery is introduced as an auxiliary to human labor and skill.

Machinery, except that of the most simple and primitive kind, bears to civilization the double relation of effect and cause. It is itself a product of civilization. The existence of all machinery, except that of the most simple character, presupposes the prior existence of civilization. Machinery is possible only subsequent to the acquisition of a greater or less degree of manual skill, and a more or less intimate knowledge of the laws of nature, on the part of the inventor. Moreover, its existence implies wants in the community, both numerous and refined in their character, which it was created to aid in supplying. These, however, are conditions not of an uncivilized, but of a civilized community; they are conditions impossible among savage tribes. Machinery is a product of civilization, and its function is to facilitate, expedite, and lessen the labor of civilized communities.

But while this is the case, it is equally the case that machinery, in turn, becomes one of the most powerful and efficient causes of civilization—one of the most effective agencies in extending the area of civilization, and carrying it to higher degrees of perfection. Nothing has given so great an impetus to civilization during the last hundred years as the inventions of that period. Who can estimate the influence on civilization of the steam engine? Of the application of steam to the propulsion of boats? Of the invention of the railroad? Of the cotton gin and the spinning jenny? Of the telegraph, which annihilates time and space, and effects the interchange of thought between points on opposite sides of the globe, as speedily and perfectly as if the interlocutors sat side by side on a sofa in their counting house or private parlor? Of the thousand other inventions, though less conspicuous than the above, which discharge important functions in every civilized community?

Civilized man, through machinery, has multiplied his power indefinitely. Who will undertake to say how much of the productive capacity of any civilized nation of the world to-day is due to the machinery which it employs? How much has every civilized country increased its power for creating wealth—for producing the objects of human want—by its mastery over the elements? Through the agency of machinery the very powers—the invisible forces—of nature, have become the servants of man. Wind and water, steam and electricity, have bowed to his yoke, and now do his bidding. His possible achievements can be measured only by their power to perform.

That machinery has increased the productive power of man indefinitely is a proposition too obvious to need proof. The evidences of it are continually before our eyes, and not to see them is to be willfully blind. This power of production has increased immeasurably also the aggregate wealth of the world. We shall not stop now to inquire into the effects of machinery on the social condition of communities. It would be an interesting inquiry, but time does not permit us to enter on it at present.

There is, however, one department of human industry, and that a most important and widely extended one, into which machinery, except of the most simple character, had not been introduced until quite recently. I refer to the department of agriculture. It is true that during the last thirty or forty years, some of the best efforts of the inventive genius of this and other countries have been put forth in devising machinery for facilitating and cheapening the labor of the husbandman. It is true, also, that these efforts have been rewarded with a large degree of success. Still, there are those present who can recollect when the sickle, if not the most common, was not, at least, an unusual instrument, employed by the farmer in harvesting his grain. Since then the sickle, as an instrument for cutting grain, has been wholly discarded. The cradle, which came next in the order of succession, has been also superseded. These belonged to a past era—an era in which human muscle, though not the sole, was yet the chief, motive power, in propelling the machinery employed by the husbandman. It is true, that from the earliest periods cattle and horses have been pressed into the service of the farmer and compelled to aid in preparing his fields for the seed from which was to spring his harvest; and also in transporting his crops to the barn, treading them out, and hauling them thence to market. But with the performance of this work they were dismissed; all else must be performed by human muscle; but with the advent of the period to which we have referred, a new epoch dawned on agricultural industry. Human muscle ceased to be the dominant element of its motive power. The inventive genius of the age, which had already signalized itself by utilizing, in a thousand different ways, the muscular power of the horse and the ox, and the infinitely vaster and more subtle and expansive power of steam, was now directed to the invention of machinery by which one or both of these powers could be employed in facilitating the work of the farm. The first result was the thrashing machine, driven by horse-power, which at once superseded the old method—venerable, but slow and tiresome—of thrashing by the flail; and, also, the equally venerable, but somewhat easier and speedier method, of treading out the grain by animals. The oldest of us can recollect when the thrashing machine was as great a curiosity as the elephant, and when, in our juvenile ardor, we would as freely have given our last dime to see one, as we would to have looked on the Bengal tiger.

Then came the reapers, the mowers, the headers—all the various kinds of machines, which the inventive genius of this and other countries, stimulated by the hope of sudden wealth as the reward of success, has spawned on the agricultural world. Even were I competent to criticise the various machines, invented to lighten and cheapen the labor of the farmer, this would not be the place to do it. It would also be premature to assert that invention in this department has gone as far as it is possible for invention to go—that the machines now in use for cutting and gathering grain are as near perfect as it is possible for human ingenuity to make them. But without stopping to express any opinion as to how near perfect the McCormick or other machines now in use are, or in what respect or to what extent they can be improved, if at all, it may be worth while to query whether the muscular power of animals is destined to be employed always, as at present, as the motor in operating them. The thrashing machine of our boyhood days was always run by horse-power; the thrashing machine of to-day is almost as uniformly run by steam-power. And we may lay it down as axiomatic, that wherever the steam engine can be used, the horse, the ox—muscular power of whatever kind—will be driven out and steam will take their place. Can steam be used as the motor in driving the machinery by which grain is cut and gathered? Time alone can return an answer to this question. But who, in the light of what has been already achieved, will venture to assert that such an application of steam is beyond the resources of inventive genius?

Although the agricultural world has been placed under repeated obligations to the inventive genius of man during the last few decades, there still remains one department of agricultural labor which is now in substantially the same condition as it was half a century ago. I refer to plowing—the process by which the surface of the earth is turned over, pulverized, and prepared for the reception of seed. I need not enlarge on this importance of the branch of agricultural labor. Every farmer understands its position in the economy of husbandry—its true relations to the productions of crop. It is not only an indespensable process, but it is a slow and an expensive one. It is not too much to assert that it is within the range of the possible that a change in the manner of performing this single branch of agricultural labor might effect an entire change—a complete revolution—in our whole system of agriculture.

I have already stated that our method of plowing is substantially the same now that it was half a century ago. The plow of to-day does not differ materially from the plow of my earliest recollections. It is true, gangs of plows are in common use now, which was not the case then. But the gang is constructed on the same principle as the single plow, and the same kind of power—the muscular power of horses and cattle—is employed in its use. The labor of plowing is both expedited and cheapened by the gang, but still the process is slow, laborious, and expensive. Has it ever occurred to you, my hearers, to ask what is the average amount of power expended in plowing a single acre of land? If we had this factor—and it ought not to be difficult to obtain it—we could readily compute this amount of power which is expended in plowing the ground for the annual crop in this State, or in the United States; or, for that matter, in all countries where agriculture is pursued. A moment's reflection must satisfy us that the aggregate of this power is absolutely enormous. The mind will sink back appalled, when it attempts to grasp its vastness.

What are the suggestions of economy on this subject? The great motive power in modern civilization is steam. Steam is the giant which the inventive genius of the age attempts to press into service wherever great power or great endurance is required. Such being the offices for which steam is recognized as being specially fitted, should it not be employed, if such employment is practicable, in plowing the soil for the annual crop? Should not the immense—almost incalculable—power which is expended in this work be drawn from this source, if it is possible to make steam available for the purpose? What labor have we which we do not compel steam to perform? Steam drives the spindles

and looms of our factories; sets in motion the ponderous machinery of our workshops; runs our mills; propels our boats, and drags along the cars on the iron rail, with the speed of the wind. Shall this giant, with greater strength than Hercules, and more arms than Briarius, who works docilely everywhere else, refuse alone to drag the plow? Will the resources of genius forever prove unequal to the task of yoking him to this humble instrument of the most necessary and honorable labor? Must the horse and the ox continue to be in the future, as they have been in the past, the sole reliance of the agricultural world for that power necessary in the preparation of the soil for the seed, from which alone can come the annual crop? As steam, with his immeasurable power and untiring energy, has, through the subtle brain and cunning hand of the inventor, been made the humble and docile servant of man, in the performance of so many labors, I cannot doubt that he will eventually be brought to do this work also.

I need not tell you that some of the best inventive genius of this country and others is now, and for several years past has been, engaged in building and perfecting the steam plow. To what extent these efforts have been successful, I am not able to state definitely. That they have been partially successful we know, for steam plows are now in use in England and other countries. But that these inventions have not yet reached that degree of perfection which will be necessary to secure their general use, seems to be evidenced by the fact that but few, if any, of them are yet employed by American farmers. The American farmer, owing to the high prices of agricultural labor which obtain in this country, as compared with European standards, is usually prompt in availing himself of all the advantages offered by new and improved machinery. And he would not be true to his traditional character for shrewdness in practical matters did he not adopt steam as the motive power in plowing as soon as it should be demonstrated to be cheaper than the old motor—animal muscle. But however far any steam plow
yet invented may be from fulfilling the conditions which are essen
prerequisites to its general adoption, we may rest in almost absolut
fidence that such a plow will be invented. It cannot be denied
obstacles in the way of the success of the steam plow are of
ble character. But great as they are, I cannot doubt that
overcome; that the steam plow will be a success; that it
ally adopted, and will supersede the present plow, in
upon which it can be used. The time will come—an
tant—when plowing will be as generally done by
as grain is now cut by reapers and headers, or th

What will be the effect of the substitution
the motive power, in this branch of agricult
the substitution, if it take place, will be,
work will be cheaper or better done, or
motives exist, it is fair to assume th
The farmer, then, who shall employ
an advantage over his neighbor w
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will be done. In either case, t
those who adhere to the old me
that all will avail themselves of
plowing, or retire from the business.

When steam was once applied to propelling boats on our rivers, the days of keel boats, which were poled and warped up against the current by the mere power of human muscle, were numbered. When steam began to be employed to spin and weave, the distaff and loom of the housewife began to fall into disuse, and soon receded in the distance. When railroads were built, and the locomotive, hitched to a train of cars, whirled them along at a speed outstripping the coursers of the wind, the occupation of the stage coach and the "prairie schooner" was gone. Steam is not only the great giant of our civilization; he is also the great monopolist. In whatever department of labor he once enters, he asserts absolute dominion—he tolerates no competition, no rivalry. His motto is: all or none. The only field on which he has ever entered and has not been able to establish his supremacy and make his motto good, is the high seas. There, and there alone, the winds of Heaven dispute with him the right of dominion; there the two powers—wind and steam—rule a divided empire. And we cannot doubt that steam, once introduced as the motive power in plowing, will drive out every rival or competing power, and monopolize the business. It will do this for the same season that it has accomplished the same result in whatever other branches of business it has been employed, to wit: because it is cheaper than any other power, and those, consequently, who employ it, can undersell, in the markets of the world, those who do not.

The first effect of the steam plow will be to cheapen the labor of plowing, and, consequently, to lessen the cost of production. The plow itself, however, will, no doubt, be a costly article of husbandry; there is, also, as little doubt that it will have a capacity to do a large amount of work, and that it can be employed to advantage only where there is a large amount of work to be done. In other words, the steam plow will be built at an immense cost; will have an immense capacity, and will require a large field in which to operate advantageously.

The two facts—the cost of the steam plow and the necessary magnitude of the scale of its operations—point unmistakably to these two results: First—Aggregations of capital on a scale hitherto unexampled, for the purpose of farming. Second—The gradual but certain extinction of the class of agriculturists know as small farmers.

The employment of the steam plow—if it shall be so perfected as to make its employment profitable—will inevitably tend in these directions, and must ultimately produce, more or less perfectly, these results. It will be thus, because capitalists who can afford the cost of a plow, and can command land enough to give it profitable occupation, can outstrip in the race of competition and undersell in the markets those who do not possess such advantages. The effect must be to cause the small farmer, who has not the means to invest in a plow or the land on which to use it profitably even if he had one, to sell his farm to his more wealthy neighbor and retire from the business. This process will continue till all the land adapted to cultivation by machinery of this kind has been absorbed by the capitalist farmers. In the meantime the small farmers, driven from the lands of this character, must betake themselves to others, on which steam machinery cannot be employed, or to the production of crops in the cultivation of which it cannot be used.

Machinery run by steam power, which from necessity must be of great weight, can never be used successfully on broken or irregular ground. It can only be employed on level, or nearly level plains. Nor can it be used, to any great extent, in the cultivation of vegetables, Indian corn, or the great staple, cotton. It cannot be used in the production of these crops, because the great bulk of the labor required in their cultivation, and in gathering them, is of such a character that it cannot be done by machinery, but must always be done by hand. Here, then, in the growing of these crops, it would seem the farmer of small means ought to be secure from the competitions of labor-saving machinery, whose cost is such that he cannot avail himself of it. But will he be? So far as vegetables and cotton are concerned, yes. So far as Indian corn is involved, perhaps, no.

Between vegetables and cotton, in the production of which mere hand labor will always be a dominant element, and the cereals, in the production of which machine labor will, in the future, constitute by far the largest percentage, there is no competition, or at most a very limited one. It is true, a very high price of the cereals, simultaneously with a moderate, or very low price of vegetables, might cause a diminished demand for the former and an increased demand for the latter, and vice versa. To this extent there might be competition between vegetables and grains. But their natural places, in the economy of civilized society, are separate, and one is not the rival or competitor of the other. Both are needed, and neither can well be dispensed with. The relations between Indian corn on the one hand, and wheat on the other, however, are different. They are rival commodities for the favor of mankind. And whether the one or the other shall be preferred, will depend largely on their relative cost. They both aspire to fill the same offices, particularly in the middle and lower grades of society, and the question of superior cheapness will generally determine which shall be chosen. And so far as feed for stock is concerned, whether Indian corn or the cereals shall be used, will generally be determined by which is the cheapest. The cereals, therefore, must be recognized as natural and legitimate rivals of Indian corn; and the question as to whether they can take its place and stop its cultivation, is one simply of how cheaply they can be produced. In this State there is very little corn produced, because the soil or climate is not adapted to its production, and the cereal grains can be produced cheaper. The same causes will produce the same effect in the great corn-growing States of the Mississippi Valley. Let labor-cheapening machinery be employed to such an extent in cultivating and harvesting the cereals, that it will cost less to produce them than to produce Indian corn, and the latter will become as rare a crop in those States as it is in this. It is not impossible, therefore, that the introduction of the steam plow may so cheapen the labor necessary for the production of the cereals, that Indian corn will practically cease to be one of the crops of the country. Should this happen, the only departments of agriculture, proper, which will be left in the possession of the man of moderate means—him of the class now known as the small farmers of the country, will be the vegetable patches, scattered everywhere throughout the land, and the cotton fields of the South. Into these, the labor-saving and labor-cheapening machinery of this progressive age, with its monopolizing tendencies, will not be able to pursue him.

But, I am asked, what will become of all the small farmers now engaged in the production of the cereals? They certainly cannot all find employment in growing vegetables and making cotton, certainly not. But because we cannot now see what they will all do, after they have been dispossessed of their farms, and have ceased to be producers of wheat and oats and barley, it will not prevent the causes which I have pointed out, from producing their legitimate effects.

That agricultural labor in the future will be performed more and more by machinery, and the machinery eventually be driven by steam, hardly admits of a doubt. And that this species of labor will tend to aggregate the capital employed in agricultural pursuits, and cause the land to be bought and held in tracts of baronial dimensions, and the small farmer class of agriculturists to be extinguished, is equally clear. If these results shall prove evils, as to some extent they undoubtedly will, it will be the office of the political economist to point out, and the work of society to apply, the remedy. The stream of invention is as headlong and resistless in its course as the waters of Niagara. We cannot stop, nor even check it in its career, if we would. We will welcome it for the many benefits it bears to us on its bosom, though it bring along, also, some evils. The evils, however numerous or aggravated their character, which follow in the train of progress, we may fondly hope will not be beyond the power of a wise statesmanship to remedy.

TRANSACTIONS OF THE
SOUTHERN DISTRICT
AGRICULTURAL SOCIETY,

FOR

THE YEAR 1873.

OFFICERS FOR 1874.

PRESIDENT.

Ex-GOVERNOR JOHN G. DOWNEY .... Los Angeles.

SECRETARY.

MAJOR BEN. C. TRUMAN .... Los Angeles.

TREASURER.

ISAIAS W. HELLMAN .... Los Angeles.

VICE PRESIDENTS.

HON. F. M. SLAUGHTER .... San Bernardino.
FRANCISCO FORSTER .... San Diego.
JARRETT T. RICHARDS .... Santa Barbara.
GEN. GEORGE STONEMAN .... Los Angeles.
L. H. TITUS .... Los Angeles.

BOARD OF DIRECTORS.

WILLIAM H. WORKMAN, JOHN S. GRIFFIN, GEORGE R. BUTLER,
L. J. ROSE, H. D. BARROWS, O. W. CHILDS.
WILLIAM FERGUSON.

EXECUTIVE AND FINANCE COMMITTEE FOR 1874.

W. I. HELLMAN. DR. JOHN S. GRIFFIN, H. D. BARROWS.

MEMBERS OF THE SOCIETY.

The following are the names of the members who, up to the first of December, eighteen hundred and seventy-three, had paid eleven (11) assessments on (each) the number of shares set opposite their names:

Names.	No. of shares.
George Matfield	5
H. D. Barrows	5
George R. Butler	5
Dr. Macdougall	3
R. Burnett	5
H. F. Baker	1
O. W. Childs	10
Caswell & Ellis	3
John G. Downey	10
H. Dockweiler	2
C. Ducommon	5
J. H. Wright	2
Ferguson & Metzker	5
Chris. Fluhr	3
H. Fleishman	2
J. S. Griffin	8
Hancock Johnson	2
Thomas Gates	2
C. C. Higby	1
Isaias W. Hellman	5
T. & S. Mott	5
Oscar Macy	2
H. Newmark & Co	5
H. K. S. O'Melveny	3
Dotter & Bradley	2
Thomas Rowan	3
Workman Brothers	5
T. Wollweber	1
H. S. Orme	1
J. Jones	5
Louis Wolfskill	2
J. A. Fisher	2
William Dryden	1

Names.	No. of shares.
Ben. C. Truman	2
H. C. Wiley	2
J. M. Graves	2
Pio Pico	10
P. Beaudry	10
S. Lazard & Co	2
W. B. Lawlor	3
F. P. F. Temple	5
A. Ellis and F. Gibson	5
J. Reed	5
William Rowland	2
George A. Johnson	10
F. P. Forster	10
F. M. Slaughter	5
J. W. Waters	3
William A. Conn	5
L. J. Rose	10
J. de Barth Sharb	5
L. H. Titus	5
General George Stoneman	5
Jarrett T. Richards	1
W. J. Brodrick	2
J. F. Ward	1
C. E. Thom	5
J. R. Holmes	1

The following gentlemen have paid up in full:

Names.	No. of shares.
Thomas W. Temple	2
J. M. Riley	1
J. M. Griffith	5
Dr. W. F. Edgar	2
S. J. Lynch	2
Albert J. Johnson	2
Patrick Halpin	1
Thomas & Estudillo	6

CONSTITUTION.

ARTICLE I.

This association shall be known and designated by the name and style of "The Southern District Agricultural Society of California," and be composed of the Counties of Los Angeles, Santa Barbara, San Bernardino, Kern, and San Diego.

ARTICLE II.

The objects of this society are, the fostering, encouraging, promoting, and aiding in developing agriculture, horticulture, domestic manufactures, mechanics, household economy, rural practice and taste, and general domestic industry; stock raising in its various branches, and the improvement of all useful domestic animals; and for the trial of speed of horses, and for the dissemination of useful information on these subjects.

ARTICLE III.

The officers of this society shall be, a President, five Vice Presidents (one from each county in the district), a Secretary, a Treasurer, and seven (7) Trustees, all of whom shall be stockholders of this society at the time of their election. The said officers shall form a Board (to be known as the Board of Managers) for the government of this society; and in said Board of Managers shall be vested (except as otherwise herein provided) all the powers and duties of this society. A majority of said Board of Managers (or five of said Board, etc.,) shall form a quorum to do and transact business.

ARTICLE IV.

The said officers shall be elected annually, by the stockholders of this society, on the first Saturday of January in each year, and shall hold their offices for one year, and until their successors are elected and assume their duties. At all elections the voting shall be by ballot, and be decided by a majority of the votes cast—each share of stock being entitled to one vote, either in propria persona or by proxy, at elections and all other meetings of the society.

ARTICLE V.

The President shall preside at all meetings of the society and of the Board of Managers; shall put all motions and declare the result, and, in the event of a tie, give the casting vote. In the absence of the President, one of the Vice Presidents shall preside; and, in the absence of the President and Vice Presidents, a President pro tempore shall be appointed by the members present, who shall have similar powers and duties.

ARTICLE VI.

The Secretary shall attend the meetings of the society and of the Board of Managers, and shall keep a record of the proceedings; he shall register, in books to be kept for that purpose, the life and annual members of the society, and shall keep the stock books of the society; he shall, at any Fair or other exhibition of the society, make an entry, under its appropriate department, of the name of the animal or article or object exhibited for a premium, and the name and residence of the person exhibiting it, and shall, in the same book, record the award of the committee. He shall receive all moneys paid to the society, and pay the same, unless otherwise ordered by the Board of Managers, to the Treasurer, taking his receipt therefor. At any Fair, or other exhibition of the society, he may appoint such assistants as he may deem necessary, to aid him in the performance of his duties. He shall receive for his services such compensation as the Board of Managers shall allow, and shall give bond for the faithful performance of his duties, in such sum and with such security as the Board of Managers may direct. If the Secretary shall be absent from any meeting of the society, or of the Board of Managers, a Secretary pro tem. shall be appointed by the society, or by the Board.

ARTICLE VII.

The Treasurer shall keep accurate accounts of all moneys and other articles received by him as Treasurer, from whom received, and to whom and for what purposes paid out; and shall make a report on the financial operations and condition of the Treasury as often as may be required by the Board of Managers, and shall make an annual settlement of his accounts with the Board of Managers, which shall be submitted to the society at each annual meeting of the society. He shall deliver to his successor in office all moneys, papers, and other property of the society in his possession. He shall give bond in such sum and with such security as the Board of Managers may direct, conditioned that he will receive and pay over, on their order, all moneys and other articles, the property of the society, that may come into his hands as Treasurer.

ARTICLE VIII.

When any vacancy or vacancies occur in the number of Trustees, the same shall be filled by appointment of the Board of Managers, and they shall cause a minute thereof to be entered in their proceedings; and when a vacancy occurs in the Board of Trustees, any three or more members of the society may call a meeting thereof for the purpose of filling such vacancies. If any member of the Board of Managers shall be absent from four successive meetings thereof, unless he be absent by reason of sickness, or has been granted leave of absence, or gives a reason for such absence satisfactory with the Board of Managers, his office shall be by them declared vacant. No member of the Board of Managers, except the Secretary, shall receive any compensation for his services; but the Board may refund to any member thereof the amount of any actual expenses that may have been incurred by him on business of the society, if approved by said Board, as judicious and proper to be made.

ARTICLE IX.

Any white person, on paying to the society the sum of twenty-five dollars, for the purpose of becoming a member, shall be a member thereof for life, and there shall be issued to such person a certificate of life membership, signed by the President and Secretary, stating that such person, having paid such sum of money, is a life member of the society, and entitled to all the rights and privileges thereof.

ARTICLE X.

Any white person, on paying to the society the sum of five dollars, for the purpose of becoming a member thereof, shall be a member for one year, and there shall be issued to such person a certificate of annual membership, signed by the President and Secretary, stating that such person, having paid such sum of money, is a member thereof for the year designated in the certificate, and entitled to all the rights and privileges thereof for that year. Annual memberships shall expire on the thirty-first of December of each year.

ARTICLE XI.

The meetings of the society shall be semi-annual. The first semi-annual meeting shall be held on the first Saturday of January of each year, at which meeting the annual election of officers shall be held, and such other business shall be transacted as the members present shall deem necessary. The second semi-annual meeting shall be held at such time as may be fixed upon at the first semi-annual meeting. The said semi-annual meetings may be adjourned from time to time, as a majority of the members present at such meetings may deem necessary.
members of the society, present at any meeting thereof, shall constitute a quorum to do and transact business.

ARTICLE XII.

The Board of Managers shall declare the animals, objects, or articles that may be exhibited at any Fair, or other exhibition of the society; fix the amount or kind of premiums that may be awarded to successful competitors; and the days and terms of such Fair or other exhibition; the prices of admission of spectators and others thereto; the manner of awarding premiums; and do all and singular the matters and things necessary and competent to the success of the objects of the society.

ARTICLE XIII.

The President, or any three members of the Board of Managers, may call a meeting of the society, stating the time and place of such meeting, and giving at least five days notice from the publication thereof. The President, or any two members of the Board of Managers, may call a meeting of the Board of Managers.

ARTICLE XIV.

In case the annual election of officers shall not be held as herein provided, the President, or Secretary, or the Board of Managers, or any five members of the society, may call a meeting of the society, giving at least ten days notice thereof by publication, stating the time and place, for the purpose of electing officers.

ARTICLE XV.

The Board of Managers shall cause to be held, at least once in every year, a Fair and exhibition.

ARTICLE XVI.

The officers of this society, elected at the first election, shall continue in office until the next annual election of officers, as herein provided, and until their successors are elected and assume their duties.

ARTICLE XVII.

This constitution may be altered or amended at any semi-annual meeting of the society, by a vote of two thirds of the members present at such meeting.

L. J. ROSE, President.
ALBERT J. JOHNSTON, Secretary.

MAY 6th, 1871.

BY-LAWS.

SECTION 1. The Board of Managers shall appoint a Marshal, whose duty it shall be to superintend the exhibition, preserve order, and see that all stock and other articles entered for exhibition are put in places designated for the same. The Marshal may appoint such assistants as he may think necessary.

SEC. 2. The Board of Managers shall appoint committees to make awards of premiums on the animals or articles offered for exhibition; but no member of any committee, who is an exhibitor, shall take any part in the decision of the committee in the department or class in which he is an exhibitor; and, if the remaining members of the committee cannot agree, the Board of Managers may supply the vacancy, or appoint a new committee, or may allow the remaining members of the committee to supply such vacancy. In case any person appointed on a committee refuses or neglects to serve, the Board of Managers may appoint some one in his stead, or may allow the remaining members of the committee to make such appointment.

SEC. 3. The Board of Managers shall appoint, during a Fair, or other exhibition of the society, such subordinates as may be necessary to promote the general interests of the society.

SEC. 4. Any stock exhibited for a premium shall be entered in the name of the owner; and any other articles exhibited shall be entered in the name of the producer, manufacturer, or inventor thereof, or in the name of the person under whose supervision or control the same was produced, manufactured, or invented.

SEC. 5. No premium shall be awarded to any animal or article, whether there be competition or not, unless the same be worthy of a premium. No article or animal shall be allowed to compete for a premium in more than one class at the same Fair.

SEC. 6. Trials of speed shall be governed by the rules and regulations of the

SEC. 7. Every article or animal exhibited for a premium shall, during a Fair, be subject to the control of the Board of Managers.

SEC. 8. The Board of Managers may annually elect some person to deliver, during the Fair, an address, connected with the objects of the society.

SEC. 9. The stockholders and life and annual members of this society, with the ladies and children of their families, will be admitted, free of charge, to any Fair or exhibition of the society. Members will be furnished by the Secretary with badges, and will be expected to wear the same during the Fair.

SEC. 10. The meetings of the society shall be held at such a place, in the City of Los Angeles, as the Board of Managers may provide.

SEC. 11. The Fairs or exhibitions of the society shall be held at the grounds of the society, near the City of Los Angeles.

SEC. 12. These by-laws may be altered or amended at any meeting of the society. The Board of Managers may adopt such rules and regulations as may be necessary.

L. J. ROSE, President.

ALBERT J. JOHNSTON, Secretary.

Dated May 6th, 1871.

SECRETARY'S REPORT.

LOS ANGELES, December 1st, 1873.

SIR: I have the honor to make the following report of the Fair meeting of the Southern District Agricultural Society of California, which took place on the tenth, eleventh, twelfth, thirteenth, fourteenth, and fifteenth of November, eighteen hundred and seventy-three. The weather was very fair, and auspicious throughout; and taking everything into consideration, the meeting was a success.

Although our premiums on stock were the same as those offered by the State society, the competition was not large or animated; although some very fine stock was exhibited—especially horses and sheep.

The speed programme, one of the prominent features of all Fairs, was of the most unexceptionable character. Some of the finest and fastest racers and trotters in California, and the most superior ones raised in this portion of the State, participated in the contest. There was a day set apart for the parade of stock, and for an exhibition of ladies' riding, in which horse racing was entirely excluded in order to afford a pleasant and recreative day to those who do not approve of the latter. There were premiums offered for drawing, composition, and caligraphy, a feature introduced by Mr. Slaughter, and commented handsomely upon by every paper in the State, nearly, while the rink, to use the words of a leading city paper, on the morning of the eleventh, was overflowing with exhibitions, and one's eyes met, as he entered on the left, a "fine cabinet and door, worsted work in the form of flowers and vines, wax flowers, embroidery, shell work, embroidered shirt fronts, other articles in linen embroidery, a highly attractive cashmere opera cloak with long fleece; and continuing to the end of the hall, on the same side, silk embroidery on cardboard, more worsted work on a large cushion, parafine in various forms, other interesting articles connected with geology and mineralogy, millinery, braiding, tapestry, quilts, and saddles and harness. On the right, entering, sewing machines, cotton, cabbages, potatoes, jellies, fruits, photographs, knit lace, embroidery, preserved fruits, crochet work, flowers in shells and feathers, shell frames, stuffed birds in large cases, and a specimen of Los Angeles manufactured barrels. Down the center, entering, stoves and various articles appertaining to cooking and for the household, a parterre of fruit, sewing machines, flowers, melons, and cotton in bloom." We can hardly add to this elaborate description, except to state that there were orange, lemon, lime, citron, banana, and other semi-tropical fruit trees in bearing order, with the fruit in different stages hanging invitingly from their branches. There were pomological displays made by Mr. Childs and Mr. Montague that never had an equal in any of the State Fairs; there were wines and raisins, produced in Los Angeles County; also salt of many varieties, from the coarse rock to the finest table variety, manufactured by Mr. Trudell, of this county; also petroleum, borax, and other specimens of

our mineral wealth—in all a most marvelously excellent exposition of a society only a little over two years old.

The exhibition of stock—as I have before stated—and particularly cattle and hogs, was not large; indeed, it was not what it ought to be, for the inducements held out are precisely the same as those of the State Fair, as our catalogue of premiums is the same, figure for figure, all the way through. But we hope to improve in this particular. The aggregated wisdom of the society may harmoniously suggest improvements and correct abuses when necessary; and, in time, with the press and the best people in the district in sympathy with the society, and jealous of its interests, a general good may be subserved, and equivocal and permanent success attend the efforts of its Directors.

We look upon the Southern Agricultural Society and the Los Angeles Chamber of Commerce as the two great fulcrums we have in our midst; and we place them both on a level with our churches, our academies of learning, our benevolent societies, and our libraries, in the dissemination of general good.

Among the valuable acquisitions to the county exhibited at the Fair grounds was a pen of Spanish merino sheep. They were imported from Vermont by Mr. Kirkpatrick, and were sold by him to Messrs. Beach & Butler at a large price. The quality of wool which they carried was extra fine, and we doubt if any finer animals of the kind can be found in the United States. A judge of wool and a manufacturer of much experience, stated the value of this wool at one dollar per pound, provided sufficient could be procured to run a fine set of machinery through the season. Mr. Kirkpatrick imported ninety-two head, all of which were taken by Messrs. Beach & Butler. We have seen no importation of animals into Los Angeles County which promises so much real benefit to the community at large as those fine sheep, and we hope Messrs. Beach & Butler will be well compensated for their liberal investment.

Messrs. Garnier also exhibited a pen of French merinos. Two of the bucks sheared fifty-two pounds each, being sheared twice during the season, twenty-six pounds each time.

Mr. William Workman, of La Puente, sent to the Fair for exhibition (but not to compete for premium) a magnificent bay stallion of the Lummux stock. This stock is noted in Oregon for their great docility and tractability, from which the latter unseemly name of Lummux was derived, and also for their valuable qualities as business and farm horses. Many of the fastest half-mile horses ever run were of this stock. Comet, Amadan, Firefly, and even the winner of the half-mile race on the third day, were of this stock. White Stocking was by Parish's Fireman, and the latter's dam was Seed Wheat and his sire Langford.

The races were all well attended, the grand stand being almost entirely filled by ladies each day.

There is something irrepressively enlivening in the very name of racing; and, while it is only fair to acknowledge that none but the genuine sportsman can fully enjoy the zest of the thing, the general public can respond to the noble energy of the horse, which, seeming to feel the importance and sacredness of the trust confided to it, is willing to run its life away in the race for fame for itself and fortune to its owner. The heart leaps, the veins swell, the blood tingles, the nerves vibrate, as one watches the closely-contested race; the value of every inch of ground is understood, the noble beasts vaulting through space with a speed superior to that of the locomotive. And no wonder that men (and women, too,) get excited, for what more soul-stirring picture is there, than to see the very finest specimens of brute excellence, the elect of their race, seemingly almost instinct with soul, straining every energy, thronging with tremendous throes of absolute abandonment for the goal? What more inspiring sound can there be than the thick thunder of the trampling hoofs coming up the splendid straight reach of the home-stretch, the noble animals neck to neck, shoulder to shoulder, wheel to wheel, every nerve and muscle alive with hot expectancy, eager as the master for the victory? The whirling wheels flash into one seeming solid round; the drivers, mad with rivalry, bend over their flying animals, and with voice and every urgency, call forth the last power of the gallant brutes; the fleeting throng of the swift steeds gather toward the finish; in seconds is crowded the ecstatic excitement of a lifetime. What sweeter music can there be than the sob's middle melody in the throat of the splendid racer, as he darts by with bating breath and swelling nostrils, his eye flashing with quick intelligence, and bent on victory? Such scenes and sights are worth years of the tame and ordinary vegetating on which we call life.

That which seemed to many to constitute the most charming intellectual repast was the exhibition at the Pavilion, where the magnificent and lush gifts of nature were placed alongside the mechanic skill and ingenuity of man. The number of spectators was very large, and the area of the vast hall was so replete with humanity that rapid movement became an unattainable luxury. It was an entertainment, indeed, just to stand still and gaze on the splendid array of bud and blossom fragrant, and the sweeter smell of those fairer human flowers, whose combined excellences Milton so glowingly depicts in the portraiture of their common mother. Calypso and her nymphs never could have occupied, even in imagination, a grotto so replete with natural beauty and delights, and so varied in its attractions.

The orchestra, one of the irresistible adjuncts of the elaborate provisions made by the Directors, seemed inspired by the excitement of the occasion, the *coup d'œil* and the company, an inspiration finer and stronger far than new wine, and certainly its mellifluous discourse of exquisite *morceaux* from brilliant operatic transcriptions and popular gems of minstrel melody, was received with critical content. With good music, sweet flowers, and lovely women, all components were attendant for felicity, and accordingly measured grace of festivity ruled the hour.

SOME OF THOSE PRESENT.

Among the gentlemen present at the Pavilion the first evening were: Senator Maclay, of Santa Clara; John Quincy Adams, Esq., of Boston, Massachusetts; John and William Ellwell, W. T. Williams, Juan Camarillo, and Manuel Anginsola, of San Buenaventura; Messrs. Parker, Gifford, Thomas, and others, of San Diego; ex-Governor Drew, of Arkansas; Messrs. Slaughter, Adams, and others, of San Bernardino; Messrs. Jones, Reed, Tofflemier, of El Monte; Messrs. D. T. Richards, of the Santa Barbara *Times*, B. Jacques, Kinton Stevens, Stephen Smith, W. M. Eddy, Arza Porter, Andy Horen, N. Covarrubias, Ramon de la Cuesta, E. S. Lowery, W. H. Cade, William Elland, P. J. Barber, J. K. Fisher, José Marago, and other gentlemen from Santa Barbara; Joseph Bridger, Dr. Griffin, Captain Haley, Judge Nichols, Hon. Tom Mott, Henry Hazard, Sheriff Rowland, Governor Downey, Francisco Machado, Don Pio Pico, Hancock Johnston, Dr. Wise, General Andres Pico, Judge Mallard, L. J. Rose, President of the Association, Major Peter Thompson, Oscar Macy, Henry Austin, Louis Wolfskill, Judge O'McIveny, Judge Sepulveda, F. Koffman, James Billings, Pancho Coronel, Colonel Baker, Aaron Smith, James Howard, Dr. Crawford, Dr. Wollweber, Mr. Ward, W. Ferguson, of Los Angeles, and at least five hundred ladies.

The grandest day of all, however, was the fifth day, set apart exclusively for ladies' riding. The day was very beautiful, and the grand stand was completely jammed with ladies. It was the largest crowd ever seen on the course.

A committee of thirteen, composed partly of ladies and partly of gentlemen, made up, and Mr. President Rose informed the committee that, to place their decision beyond suspicion of prejudice, either for or against any of the fair contestants, each member of the committee should be provided with the names of all the lady riders, on a piece of paper, and mark opposite the names their estimate, in figures of one to eight, of the character of the riding, and then deliver to the President their estimates privately done up.

The following ladies contested: Mrs. Pleasants, Miss Nettie McCrary, Miss Eviza Johnson, Miss Nettie Stewart, Miss Erolinda Cota, Miss Albertina Haley, Miss Jennie Shannon, and Miss Eva Parker.

And a most excellent exhibition of daring and graceful equestrianism it was. It lasted nearly two hours, during which the ladies galloped around the park, briskly, leisurely, and otherwise. Then each lady exhibited her riding qualities separately, and all were received by the vast assemblage with marked evidences of approbation.

The ladies were all dressed prettily, and all gave exhibitions of more or less knowledge of the management of a horse. Some of the exhibitions of graceful and daring equestrianism were simply superb, and all were good; and, we may add, that (although the vast audience was unaware of the peculiarly fair and careful manner devised for selecting the riders according to their order of riding) when the names of the ladies were announced from the judges' stand, vociferations of approval rent the air.

We herewith present the names of the ladies and gentlemen constituting the committee, and a table condensing their respective decisions: Mrs. Tom Mott, Mrs. Dr. McDougall, Mrs. Gregory, Mrs. T. Gates, Mrs. Vandergraf, Don Pablo Pryor, James Billings, Hon. Asa Ellis, Col. E. Sanford, E. B. Gifford, E. F. DeCelis, Mr. Escandon, Mr. Covarrubias.

Name.	Estimate.													Premium.
Mrs. Pleasants..........	2	2	3	2	4	2	2	3	3	5	8	2	2—40	.........Third premium.
Miss Haley..............	1	1	1	1	1	1	1	1	1	1	1	1	1—13	...........First premium.
Miss McCrary..........	7	7	6	7	5	8	8	8	7	7	7	7	8—92	........Eighth premium.
Miss Stewart............	8	8	4	8	6	6	7	7	8	8	6	8	7—91	......Seventh premium.
Miss Cota................	3	3	2	3	2	4	4	4	2	2	2	3	3—37	........Second premium.
Miss Parker.............	4	4	8	4	8	3	5	2	5	6	3	3	4—60	.........Fourth premium.
Miss Shannon...........	6	6	7	6	3	5	6	5	6	3	4	6	5—69	..........Sixth premium.
Miss Johnson...........	5	5	5	5	7	7	3	6	6	4	5	5	5—68	...........Fifth premium.

Mr. Rose read distinctly the names of the premiums and their order, and stated that the ladies could select, according to their numbers, premiums to suit themselves, and that the premiums would be presented at the Pavilion that evening. So, on the evening of the fourteenth ultimo, the Pavilion was jammed with the friends of the fair contestants, and the ladies selected as follows, Judge O'Melveny officiating as master of ceremonies during the interesting occasion:

Miss Haley—The gold watch, for which the society paid fifty-seven dollars.

Miss Cota—A Florence sewing machine, for which the society paid seventy dollars and cost of transportation added, eight dollars.

Mrs. Pleasants declined accepting a premium.

Miss Parker selected the saddle, worth forty dollars.

Miss Johnson—A set of gold jewelry, worth thirty-one dollars.

Miss Shannon—A pretty gold mounted whip, worth fourteen dollars.

Miss Stewart—A gold locket, ten dollars.

Miss McCrary—A silver napkin ring, six dollars.

PREMIUMS FOR PENMANSHIP, ETC.

The premiums for penmanship, for which there were twenty-three contestants, were awarded as follows: First premium, ten dollars, to Miss Nellie Levi; second premium, five dollars, to Miss Nellie White. The premiums for first and second best specimens of original compositions, were contested for by eight scholars, and the awards were as follows: Miss Jessie Peel, first premium, ten dollars; Miss Ida Addis, second premium, five dollars. There were fourteen contestants for the premiums for drawing, and Master Isaac Benjamin was awarded the first premium, ten dollars, and Miss Nettie Stewart the second, of five dollars.

PREMIUMS AWARDED.

Article.	Exhibitor.	Premium.
Best display of stoves, (parlor and cooking,) manufactured copper, brass, britannia, and tin work	M. W. Childs	$38 and silver medal.
The society also make particular mention of Mr. Child's splendid display of stoves, ranges, kitchen utensils, gas fixtures, etc.		
Fine display worsted work. zephyr flowers, and lamp mats	Mrs. J. Ferguson	$7
Wardrobe and two doors, manufactured of redwood and white cedar	D. N. Winbigler	Silver medal.
Crochet and needlework	Mrs. H. Graf	$5 and silver medal.
Fine oil paintings	Mrs. J. C. Littlefield	Silver medal.
Needlework	Mrs. Bounce	Silver medal.
Fine display of fancy goods, etc	Dunsmoor Bros	Hon. mnt'n, sl'vr md'l.
Fine agricultural display	David Lewis	Silver medal.
Best bale of hops	David Lewis	$3 and silver medal.
Best display of cabbage	David Lewis	$2
White potatoes	David Lewis	$2
Onions	David Lewis	$2
White beans	David Lewis	$1
Fancy needlework	Mrs. M. Shaw	$5 and silver medal.
Best sample of cotton	Mills & Strange	Silver medal.
Best watermelon	Mills & Strange	$1
Best display of wheat	D. Raab	$5 and silver medal.
Best general display of fine harness of all kinds, and goods in that line	Bell & Green	Silver medal.
Buggy harness	Bell & Green	$5
Farm harness	Bell & Green	$10
Best saddles	S. C. Foy	$5 and silver medal.
Best saddletrees	S. C. Foy	$3
Best display of wines	H. Dalton	$10 and silver medal.
The members of the committee sampled a number of the Azusa wines, and pronounced them unexceptionable.		
Embroidery	Mrs. J. H. Easton	Silver medal.
For fine diplay of brown and white bread and butter	Miss A. Thomas	Society's medal.
Best display of raisins in boxes	H. Dalton	$10 and silver medal.
Best and largest display of preserves and jellies	Miss F. Dye	$10
Bread	Miss E. Messer	Favorable mention.
A small but splendid display of apples	Mr. Morenhaut	Favorable mention and silver medal.
Fine but small sample of wheat grown on hill land without irrigation	W. W. Standefer	Favorable mention.
Fine display of fruit, in varieties	R. Montague	$10 and silver medal.
A very fine display of olives from the San Fernando Mission	Antonio Cuyas	Silver medal.
Banana plant in fruit—a most magnificent tropical display—a full grown tree, raised in Mr. Workman's garden, on Main street, with clusters of the peculiar fruit	Elijah Workman	$10 and silver medal.
Best exhibition of portrait painting	V. Wolfenstein	$3

Article.	Exhibitor.	Premium.
Best exhibition of photographs	V. Wolfenstein	$10
Most meritorious and beautiful display of productions in the art of photography	V. Wolfenstein	Silver medal.
Best display of apples	O. W. Childs	$5
Best twelve varieties of apples	O. W. Childs	$5
Best display of pears	O. W. Childs	$5
Best twelve varieties	O. W. Childs	$4
Best green figs	O. W. Childs	$3
Best display of tropical fruits	O. W. Childs	$10
Best lemons	O. W. Childs	$5
Best general display of fruit, embracing best and general varieties	O. W. Childs	$10
Best half peck English walnuts	O. W. Childs	$5
Best chestnuts, different varieties	O. W. Childs	$5
Best black walnuts	O. W. Childs	$3
For this display the society also gives its silver medal.		
Best display of Australian plants	O. W. Childs	$2
Best display of cut flowers	O. W. Childs	$5
Fine display of orange, lemon, lime, citron, and chestnut trees (the lime and citron trees in bearing order)	O. W. Childs	$10
Best brandy peaches	Mrs. Joseph Huber.	$3 and silver medal.
The Lord's Prayer in needlework (by a lady of Mrs. Pridham's family), made 114 years ago	Mrs. Wm. Pridham	Honorable mention.
Pruning shears, a fine invention for trimming trees	Mr. Sanders	Silver medal.
Fine specimens of white and brown bread	Mrs. E. K. Green	$5
For water-power invention, for sewing machines and other light running inventions	Henry Campbell	$5 and silver medal.
Fine display of stuffed birds	John Cashion	$5 and silver medal.
Best model for fitting ladies' dresses by self-measurement	Madame Brossé	Society's sil. medal.
Best piano and table cover	Miss P. Mascarel	Silver medal.
Best baby counterpane and baby's embroidered dress	Mrs. J. Newmark	Silver medal.
Best display of millinery goods	Mrs. M. E. Park	$5 and silver medal.
Display of paratine and petroleum, from the oil wells of San Fernando	Dr. V. Gelcich	Silver medal and honorable mention.
Display of borax, from the Pioneer Borax Works, in a refined state	Robbins & Co	Silver medal.
Worsted work	Nellie Cabanis	Silver medal.
Worsted work	Miss Roberts	$5 and silver medal.
Fine display of silver and gold plating	V. Trumper	Silver medal.
Braided shams	Miss Annie Rose	Silver medal.
Angora goat wool opera cloak and fancy needlework	Mrs. Jenkins	$5 and silver medal.
Shell work and moss work	Mrs. D. G. Stevens	$5 and silver medal.
Fine display of needlework, done on the new Wilson sewing machine	Mrs. May	Silver medal
Moss and shell work	Miss Colbraith	Silver medal
Pincushion	Miss M. Enriques	Silver medal
Embroidered handkerchiefs	Miss L. Lehman	Silver medal
Wax work	Miss Eviza Johnson	Silver medal
Wax work	Miss Bilderrain	Silver medal
Pencil sketching	Miss Emily Smith	Silver medal
Sofa cushion	Mrs. Parr	Silver medal
Mahogany book case	John Victory	$5 and silver medal
Flowers worked in silk	Miss Eliza Victory	Silver medal
A splendid display of salt, graded, from coarse to a fine table article	Pioneer Salt Works	Silver medal
Rag rug	Mrs. R. B. Russell	Silver medal
Rag rug	Mrs. G. E. Milliken	$
Display of silk embroidery	P. R. Asevedo	Silver medal
Best display of honey	Mrs. M. Pleasants	$

Article.	Exhibitor.	Premium.
Display of needlework	Mrs. M. Pleasants	$5 and silver medal.
Preserved fruits, jellies, and jams	Mrs. L. A. Johnson	$5 and medal.
Barrel made of California oak	James Doyle	$5 and silver medal.
Bread and butter	Josephine Dalton	Silver medal.
Fine top buggy	L. Lichtenberger	$10 and medal.
Several varieties of tobacco plant. The society make particular mention of this exhibit, and hope that the cultivation of tobacco may grow into an industry of great importance to this district	Dr. Howard	Silver medal.
Fine display of orange, lemon, lime, citron (in all thirty odd varieties), trees. Many of these trees are eight months old from the graft, and from six to ten feet in height, and are very graceful in their contour, and thrifty in their general appearance. The society make particular mention	Thomas A. Garey	$20 and silver medal.
Quilt	Mrs. Moody	$5
Silk quilt	Mrs. Bilderbeck	$5
Exhibition of the ramie plant. The society suggest that this plant be given a fair and careful trial	S. S. Bequette	Silver medal.
Very fine landscape, and other paintings	Mrs. Smith	$10 and medal.
Rose buds	Mrs. Lucy Huie	Favorable mention.
Painting and drawing, the results of the first course of lessons from Mrs. Lu. Wheat Smith	Miss C. Hereford	Silver medal.
Silk embroidered arm chair	Miss P. Armstrong.	Silver medal.
Fine specimens of shell and moss work	Mrs. Howland	$5 and silver medal.
Display of needlework and dressing gown	Mrs. Klaiber	$6
Display of shell work	Mrs. Klaiber	Silver medal.
Fine specimen of knit lace	Miss E. Chapman	Silver medal.
Best method of repairing sewing machines	M. C. Baker	Silver medal.
Best machine sewing (Wilcox & Gibbs machine)	Miss M. L. Hait	$5 and silver medal.
Magnificent display of ornamental needle work, done on a Florence sewing machine	Mrs. Mauvais	Silver medal.

PREMIUMS ON STOCK.

HORSES.

Animal.	Exhibitor.	Premium.
Clay bank gelding, saddle horse, Bayou	Thomas Sanches	$15
Roadster, bay stallion, two years old, dam Maggie Mitchell	Charles Durfee	$10
Roadster, Josie Cole, two year old bay, by Moor, dam a Morgan mare	Hancock Johnson	$15
Roadster, Bessie Belle, sorrel filly, one year old, sired by Overland, dam Silvertail	Hancock Johnson	$5
Roadster team, two sorrel mares	William Williams	$20
Stallion colt, eighteen months old, sired by Sacramento, dam Belle Mason, by Belmont	F. M. Slaughter	$10
Carriage horses, two bay geldings, Robin and John	George O. Tiffany	$20
Mr. F. P. F. Temple exhibited two very fine stallions, but did not contest for premiums, as they were raised at San José. They were a marked feature of the exhibition, however, and attracted much attention	F. P. F. Temple	
Oregon Queen and filly, by Echo; Oregon Belle and filly, by Echo; yearling mare, Echo Belle, by Echo		$55
Bay stallion, four years old, by Monarch, dam unknown	John Angelo	$20
Yearling gelding, by Echo, dam Saltzman mare	L. H. Titus	$5
Four year old bay stallion roadster, Overland, sired by Bald Chief, dam Madam Botts	L. J. Rose	$30
The King, bay horse, four years old, by Prince of Wales, dam Missouri, thoroughbred	Dr. Stanway	$20
Pride of Kentucky, aged brown mare, sire Kearney	Dr. Stanway	$10
Yearling bay filly, name Ballet Girl, by Monday, dam Balerina, by imp. Balerina	J. W. Donathan	$25
Two year old colt, sorrel, by Geo. Walker, dam a Boston mare	Joseph R. Berry	$10
Draught stallion, gray, sired by Clydesdale, dam Morgan and Butler	F. M. Buster	$20
Two year old filly, Polly Lee, by Tenbrock, dam Belle Mason, by Belmont	F. M. Slaughter	$10
Two year old stallion, dark bay, sired by Prince Rodney, dam by imp. Alderman	H. G. Swinney	$7
Roanoke, yearling stallion, sired by imp. Emperor, dam Roanoke	Dr. Stanway	$5
Sorrel yearling filly, sired by Stark, by Volcian, by Van, by imp. Glencoe	John C. Brown	$5
Three year old sorrel stallion, by Dashaway	James Hurd	$10

CATTLE.

Animal.	Exhibitor.	Premium.
Durham bull, three years old	C. P. Coffman	$25

POULTRY.

Animal.	Exhibitor.	Premium.
One strain buff Cochins, one strain dark Bramahs, one strain light Bramahs, one strain light Houdans, one strain Leghorns, one strain Scotch Greys, two Dominiques	D. D. Brunk	$21
One coop Black Spanish, one coop Speckled Trout and Shanghai crossed	Cyrus Sanford	$9

FINE WOOL SHEEP.

Animal.	Exhibitor.	Premium.
Ram two years old and over, ram under two years old, five ram lambs	P. Garnier	$15
Three ewes, two years and over; three ewes under two years; best ewe of any age or breed; best pen of ewes	J. H. Kirkpatrick	$20

ANGORA GOATS.

Animal.	Exhibitor.	Premium.
Graded buck, General, and ewe, Beauty; five head Cashmere goats	Mrs. Pleasants	$15

FINANCIAL REPORT.

RECEIPTS.

Stock:		
George Stoneman,	$250 00	
Thomas & Estudillo	600 00	
J. T. Richards	55 00	
		$905 00
Assessments		1,225 00
Entrance money		1,129 00
Advertising in pamphlet		145 00
Receipts of Fair:		
Gate tickets	$2,102 50	
Grand stand	459 50	
Quarter-stretch badges	62 00	
Hacks	110 00	
Rink tickets	531 00	
		3,265 00
Refreshment stands:		
Eating stand	75 50	
Fruit stand	35 00	
Bar	807 50	
Soda fountain	31 00	
		949 00
Donations:		
R. Burnett, for foot race	50 00	
C. Henne, for wheat and hops	15 00	
P. Beaudry, for races	10 00	
		75 00
Returned money:		
Foot race	20 00	
Second race, fourth day, third money	30 00	
J. Kirkpatrick	20 00	
Miss Addis	5 00	
Oscar Macy, over	7 00	
		82 00
Rent of grounds		605 00
Wood		30 00
State appropriation		1,940 00
Pool money		520 00
Total		$10,870 00

EXPENDITURES.

Premiums on stock, etc		$850 00
Saddle and whip		62 00
Sewing machine		50 00
Silver medals		230 35
Jewelry		87 25
Purse money		3,405 00
Lumber for race track		518 95
Work at race track		971 10
Gum trees		44 95
Express charges on same		33 25
Legal services		30 00
Searching records		50 00
School tax		56 14
Last year's tax		77 80
Printing and advertising		443 50
Bill posting		10 00
Stamps and stationery		46 55
Rent of rink		75 00
Music		301 50
Superintendent of rink		40 00
Watchman at rink		27 50
Police services at track		180 00
Ticket sellers		54 00
Gatekeepers		60 00
Hack services		58 00
Sprinkling track		40 00
Secretary's salary		350 00
Sundries:		
Job wagon	$2 00	
Telegraphing	7 25	
Ribbons	32 25	
Express charges	7 00	
Gas at rink	29 00	
Gas fixtures	22 00	
Material for purses	3 53	
Nails, etc	24 85	
Tools, etc	38 02	
Repairing pumps	3 50	
Repairing tools	8 20	
Iron work	3 00	
Bills paid by the President	14 50	
		195 10
Total		$8,347 94

BEN. C. TRUMAN,
Secretary.

TO THE PRODUCERS OF SOUTHERN CALIFORNIA.

The following paper was prepared and read to the stockholders at their first meeting, by Major Ben. C. Truman, and ordered printed:

Gentlemen: The formation of agricultural societies for the purpose of advantageously fostering interests incident to different sections, is commendable, and is meeting with success in Los Angeles and adjoining counties.

It is peculiarly an American trait to never do things by halves; and this trait is always applicable to the American farmer. For instance, some of our farmers grow corn and barley in amazing quantities, only to discover that the market rates are hardly sufficient to cover the cost of production and transportation. If we would achieve fair pecuniary results by farming, we should not grow any single article of produce in unlimited quantities.

While the climate is almost the same the year round, throughout Southern California, no area of the same magnitude in the world presents such a diversity of desirable soil, or where there may be such a diversification of agricultural productions and marketable commodities. All the fruits and vegetables grown in the temperate zone, and all semi-tropical productions, may be successfully raised in the counties comprising our district. The orange and the apple, the lemon and the peach, the olive and the pear, the pomegranate and the plum, grow in the same orchard, while the humblest producer may "sit beneath his own vine and fig tree."

Let us, then, diversify our products; and let the agricultural colleges, or societies, secure associate effort. Let every producer make a specialty of the particular product for which his particular section, soil, cost of transportation, and distance from market are adapted. Then, if ever, the farmer can fix his own price upon everything he has to sell, and to some extent become master of the situation; while, also, by associate efforts, our agriculturists may be able to assist each other, and a fair, remunerative price can be obtained for their products.

While this is a wonderful grain and fruit producing district, the income resulting therefrom is far from being satisfactory; while the cost of articles imported for general family use almost always eats up the money realized upon our productions.

If particular attention be paid to wheat, a few miles back from the ocean, the necessity for imported flour would be entirely abated. While we do not wish to go into classical history for agricultural information, yet, in studying the agriculture of the ancients, as practiced in Egypt in the time of Joseph, and in Asia in the time of Cyrus, we cannot avoid the conclusion that wheat plants were cultivated by hand with probably more care than most people cultivate their gardens. Men that raised three hundred pounds of bread corn, or wheat, from one pound of seed, were experts at the business, although working with tools and tillage implements far inferior to ours. Herodotus, the father of history, transmits most interesting chapters on ancient agriculture, and makes statements regarding wheat culture in Persia, Phœnicia, Egypt, and Carthage, which have never been discredited. It seems that the farmers and gardeners of that day, who fed not only their households, but such vast armies as Xerxes commanded, for indefinite years in the field, so cultivated the plants obtained from one bushel of wheat as to harvest one hundred to three hundred bushels of the grain. Their success ought to encourage us to investigate their practice, and follow it, in part, at least. Wheat should always be planted in drills and cultivated by horse hoe, or a fine harrow made for the purpose. Wheat is really more sensitive than corn, and, we ask, what would be the yield of corn if the land were as hard and uncultivated and packed as wheat? Obviously not half a crop. Cultivate wheat, then, as you would corn. There is an implement used in the East known as the Thomas smoothing harrow, which would answer the purpose exactly. This machine pulverizes the surface two or three inches deep, and breaks the crust perfectly, while it leaves the land mellow, and does not disturb the wheat plants in the least.

And, in this connection, we may add that, from present indications, the best seed to be used in this district is what is known as the Sonora wheat. It is less liable to rust, and more hardy, when young, than the Australian wheat. The latter, while a splendid specimen of a cereal, will suffer from frost, if planted early, and will hardly escape rust if sown late.

Regarding barley, what is known as Russian barley must speedily come into favor with the farmers of Southern California. It stands a dry soil better than any other, and is a most prolific grain.

Butter making is now carried on successfully throughout Southern California, and very little, if any, is now imported. In this connection, let us say, that sixty acres of alfalfa will keep from thirty to forty cows the year round, while the buttermilk alone will feed from twenty to thirty hogs, and the droppings of that number of cows and swine would make the land that fed them increase in bounty and fertility. Speaking of the manufacture of butter, Mr. James F. Turner, of Lancaster County, Pennsylvania, sends to a newspaper the following statement of the product of a Lancaster dairy of twenty-nine cows for eighteen hundred and seventy-two:

Butter sent to Baltimore, in half pounds, five thousand three hundred and thirty-six pounds.

Received for same clear of commission	$2,194 37
Twenty calves, averaging $6 60	191 40
Twenty-six hogs sold	322 16
Whole amount	$2,707 93
Average per cow	93 37

Besides one thousand four hundred pounds of pork put up for family use.

The raising of poultry for family use, or for market, can be made a remunerative business. The droppings of poultry are as valuable as fertilizers, but liable to less volatile elements in the air to the injury of the manure. To prevent this loss, collect dry road dust, or loam, and dry it, to mix with the manure at the rate of about two parts of loam or dirt to one of the excrements. Let the mixing be thorough, and your fertilizer is ready for use. If you can easily get land plaster, cheap salt, and wood ashes, you can form a compound that will pay on corn, potatoes, and tobacco. On my farm, poultry pay in manure more than they cost in corn, giving eggs and chickens as clear profit. It is the office of this kind of stock to start early in the morning and pick up bushels of worms, bugs, and other small deer—change them partly into eggs and chicken meat, and partly into rich plant food for crops. On a well managed farm, the flesh and eggs of poultry are the cheapest meat raised, and as good as the best. Poultry producers ought to use condiments freely. Cayenne pepper, mustard, or ginger can, with great benefit, be added to the food of fowls, to increase their vigor, and to stimulate egg production.

This apparently artificial diet will be seen to be natural if we remember that wild birds of the gallinaceous species get access to very highly spiced berries and buds; articles that give the "game flavor" to their flesh. The ordinary food of the domestic fowl is not, indeed, entirely without some such addition, since there is more or less of an aromatic principle in wheat, Indian corn, and all other grains. Nevertheless, it is not sufficient in quantity to supply the place of the stronger spices, a taste for which is a part of the fowl's inherited constitution. A moderate quantity of cayenne, etc., added to the ground grain, is always productive of health and thrift in poultry.

The raising of fine blooded stock, and especially trotting horses, ought to receive marked attention. One good colt a year, even, would pay more than some farmers now make from forty acres of corn.

The calendar for eighteen hundred and seventy-two has not yet been made up, but it will show an increase upon that of eighteen hundred and seventy-one, from which we gather our facts. It shows that in eighteen hundred and seventy-one there were one thousand five hundred and seventy-six trotting and pacing races in the United States, representing over a million of dollars in premiums and purses, besides the great value of the horses. The horses would average one thousand dollars each, and not less than three to each race, which would be four million seven hundred and twenty-eight thousand dollars, say five million dollars, in horses alone, who have actually trotted in the several contests during the year.

From this and other reliable data, we calculate the value of those in training and exercising, but not contending in races, and those in the breeding studs, all united, would amount to not less than fifteen million dollars, being that sum invested in this country in trotting and pacing horses alone. Yet this grand total is confined to a limited number of breeders, as compared to the number of those who have the means, but who will not breed horses with improved stock, nor breed horses at all. We mention this fact as a conclusive argument to prove the immense amount of wealth that is lost to our farmers because of their want of energy and enterprise in not to a great extent availing themselves of this profitable source of revenue. Every farmer should breed horses, but as it is, only a few breed, and most of them raise only a colt or so annually, from inferior parents, and half starve the colt until it is fit to "break," and then, by a rapid process, break it sure enough, so that the time and cost, such as it is, is literally thrown away. A little more time, trouble, and cost of feed would produce a colt, from a highly bred sire and a good dam, worth four or five hundred dollars. Two such colts per year would be equal, to many farmers, to the net profits of their farms.

The stock raiser, so far as cattle are concerned, we need not address. So long as cattle can be raised and command good prices, and until many of the ranches, now roamed over by hundreds of thousands of cattle, are cut up into manageable farms, no decided improvement in beef may be looked for. Yet, the time is not distant when this class of stock will be raised by the many instead of the few.

One of our most important interests is wool growing—an interest which is becoming remunerative in the face of almost insurmountable difficulties. And I learn from such distinguished producers as Colonel Hollister, of Santa Barbara; Dr. Griffin, Los Angeles; and the Jewetts, of Kern, and others, that the different grades of merinos are the best adapted to the business of sheep raising on a large scale, because the merino is more gregarious and herds better in large bands, while its fleece furnishes the great staple for the clothing wools. The average annual increase of sheep under fair conditions in Southern California, with merinos, on a small scale, is one hundred per cent; but on a large scale only eighty per cent. The average annual yield of wool has been about six pounds for each animal.

The Cotswolds are very popular in the Mississippi Valley, and are in great demand, but it is expedient that we diversify our breeds to suit the special surrounding circumstances.

The long wools, under certain conditions, on high-priced lands, and near the great markets, may be more profitably bred than merinos. The wool now commanding the highest price is not likely to decrease in relative value, as its manufacture is rapidly increasing in the United States. They mature early; and, therefore, those intended for the butcher may be turned off at a younger age than the merino.

The Southdowns, for choice mutton, are better than either, commanding in England about two cents per pound more than the long wools. They are very hardy, good growers, and great breeders. The wool is excellent for flannels and other domestic goods. They are not heavy shearers—but as they mature early, and are easily kept, where only a few sheep are wanted on a farm this breed may be selected with great advantage. But where large flocks are wanted, and where the main object is the production of wool, and where, therefore, early maturity is not so important, the merino is, beyond all question, the sheep to select.

ELECTION OF OFFICERS FOR 1874.

LOS ANGELES, (Cal.,) January 4th, 1874.

Pursuant to call, the "Southern District Agricultural Association of California" met yesterday, at twelve o'clock M., for the election of officers, and for other business. It was the largest meeting ever held by the society, there being a majority of members present, while all of the stock was represented in propia persona, or by proxy. It was also a peculiarly pleasant and harmonious gathering, and was called to order by President Rose a little after twelve o'clock, who stated that the meeting was particularly called for the election of officers, but would be pleased to go on first with any other business.

The Secretary stated that he was preparing an elaborate report for the State Agricultural Society, which would be ready for said society about the tenth. He also read a report of the affairs of the society, which showed that the receipts of the past year were ten thousand nine hundred and one dollars, and the expenditures eight thousand seven hundred and seventy-nine dollars and ninety-four cents.

On motion of Mr. Henry T. Hazard, the society proceeded to vote for officers, previous to which the Secretary read Article II of the Constitution, which states, among other things, that in the election of officers every share of stock is entitled to a vote, and that there were to be a President, five Vice Presidents, Secretary, Treasurer, and seven Trustees to be voted for.

Mr. Workman nominated Mr. L. J. Rose, which nomination was seconded, it seemed, by every gentleman present. But Mr. Rose declined both a positive or a complimentary vote. He said he was perfectly well aware of the genuineness of the feeling displayed by the gentlemen present, but that he had fully made up his mind to run horses, etc., next year, and that really he would like to see as President some gentleman not individually interested in racing stock. He would, therefore, nominate a gentleman very well known in this district, his friend Dr. J. S. Griffin.

This was seconded by a great many, and members were anxious to press it to a vote. But the Doctor declared that he must be excused, and, as Mr. Rose would not consent to a reëlection, he would present the name of Governor John G. Downey.

No other name being presented, Mr. I. W. Hellman moved that the Secretary cast the vote of the society. Governor Downey was therefore unanimously elected.

The Secretary stated that nominations for Vice Presidents were in order.

Dr. Griffin nominated Hon. F. M. Slaughter, of San Bernardino, Mr. Francisco Forster, of San Diego, Mr. Jarrett T. Richards, of Santa Barbara, and General George Stoneman, and Mr. L. H. Titus, of Los Angeles, as Vice Presidents, who were unanimously elected.

The election of Secretary was then in order.

Albert Johnston nominated Major Benjamin C. Truman, in a neat speech, and Mr. Oscar Macy seconded the nomination.

Mr. W. Workman nominated Mr. W. J. Brodrick, which was seconded by Mr. E. Workman.

Mr. Hellman read a letter from Mr. Brodrick, in which he stated that he declined.

Mr. W. Workman then nominated Mr. Oscar Macy, who declined.

Mr. Truman was then unanimously reëlected, the President casting the vote of the society.

Mr. I. H. Hellman was then nominated for Treasurer, and was unanimously elected, the Secretary casting the vote of the society.

The following gentlemen were then unanimously elected Trustees: Messrs. William H. Workman, John S. Griffin, L. J. Rose, George R. Butler, O. W. Childs, H. D. Barrows, and William Ferguson.

The election then closed, after which Mr. Hellman made a few remarks in eulogy of the ex-President, Mr. L. J. Rose, and concluded by moving that a vote of thanks be extended him, which was very unanimously and feelingly given.

The Secretary then addressed the meeting, in which he exhibited the fact that, notwithstanding some two thousand dollars had been expended in labor and improvements at the Park grounds, the society had come out ahead, not including the State appropriation. He was glad to see so many gentlemen taking an interest, in not only the society, but the meeting. He referred to the fact that at a meeting in June last, the Secretary was authorized by a resolution, to attend to all the work of the society, including printing, making arrangements for lease of rink, getting of music, etc., and that the society did not meet again for nearly four months. He, therefore, moved that the President appoint a committee of three, to be known as an Executive Committee; that the number of catalogues, programmes, tickets, and all necessities in the way of advertising and printing, etc., shall be made known at the proper time by the Secretary to said committee, who shall make arrangements for all such work and material with the printing house that will do it the cheapest (it being understood that all will do it well).

The request was shaped afterward, in the form of a resolution, and seconded. The President appointed Mr. I. W. Hellman, Dr. Griffin, and Mr. H. D. Barrows as said committee, which was authorized to act as the Finance Committee for the ensuing year, and to be known as the "Executive and Finance Committee."

Dr. Griffin moved that the money now in bank to the credit of the society be applied to the note of three thousand five hundred dollars. Adopted.

The Treasurer then stated that the indebtedness of the society to the Farmers' and Merchants' Bank would then be about a thousand or more dollars.

The Secretary was then directed to make an assessment at once, according to law.

Mr. Dryden, a member of Enterprise Grange, and also a stockholder, addressed the meeting, and stated that there was a movement among the farmers either to fraternize with our society or to start one of their own. He thought, however, that they would very much prefer to join our society, if they could get a control of stock.

In answer to a question, the Secretary stated that out of five hundred shares, two hundred and seventy-nine had been sold.

Mr. Childs, Mr. Rose, Mr. Hellman, and other gentlemen, stated that if the farmers in this county or district will take the two hundred and twenty-one shares remaining unsold, they will contribute from their own stock enough to give them the control.

The Secretary was instructed to make this fact known, after which the meeting adjourned to the call of the President.

BENJAMIN C. TRUMAN.
Secretary.

TRANSACTIONS OF THE
CALIFORNIA
Vine Growers' and Wine and Brandy Manufacturers'
ASSOCIATION,

FOR THE YEAR 1873.

REPORT.

OFFICE CALIFORNIA VINE GROWERS' AND WINE AND BRANDY MANUFACTURERS' ASSOCIATION.

To the honorable the California State Board of Agriculture:

GENTLEMEN: We herewith hand you the report of the Board of Directors of the above named association, for the year eighteen hundred and seventy-three.

Respectfully,

G. G. BLANCHARD, President.

I. N. HOAG, Secretary.

BOARD OF DIRECTORS.

PRESIDENT.

G. G. BLANCHARD	El Dorado.

VICE PRESIDENTS.

J. R. SNYDER	Sonoma.
J. R. NICKESON	Placer.

TRUSTEES.

A. SCHELL	Stanislaus.
B. N. BUGBEY	Sacramento.
W. S. MANLOVE	Sacramento.
PROFESSOR E. S. CARR	Alameda.

TREASURER.

JOHN H. CARROLL	Sacramento.

SECRETARY.

I. N. HOAG	Yolo (Post Office, Sacramento).

STANDING COMMITTEES.

ON CULTIVATION OF THE GRAPE AND PRUNING THE VINE.

I. N. HOAG	Yolo.
ROBERT CHALMERS	El Dorado.
GEORGE WEST	Stockton.
A. D. WILSON	Los Angeles.
J. R. SNYDER	Sonoma.
B. N. BUGBEY	Folsom.
J. R. NICKESON	Lincoln.
G. N. SWEZY	Marysville.
L. J. ROSE	Los Angeles.
DR. J. STRENTZEL	Contra Costa.

ON WINE MAKING AND CLARIFICATION OF WINE.

A. HARASZTHY	San Francisco.
O. W. CRAIG	Sonoma.
GEORGE GOZINGER	San Francisco.
MATTHEW KELLER	Los Angeles.
B. N. BUGBEY	Folsom.
B. D. WILSON	Los Angeles.
ROBERT CHALMERS	Coloma.
J. R. NICKESON	Lincoln.
GEORGE WEST	Stockton.
J. STRENTZEL	Martinez.
JACOB KNAUTH	Sacramento.
A. EBERHART	San Francisco.

ON MANUFACTURE OF BRANDY FROM THE GRAPE.

GENERAL NAGLEE	San José.
GEORGE JOHNSTON	Sacramento.
L. J. ROSE	Los Angeles.
ROBERT CHALMERS	Coloma.
O. W. CRAIG	Sonoma.
CHARLES KING	St. Helena.
B. N. BUGBEY	Folsom.

ON CASKS, VESSELS, PRESS, AND MACHINERY.

GEORGE JOHNSTON	Sacramento.
J. R. NICKESON	Lincoln.
CARL STROBEL	Sacramento.
ROBERT CHALMERS	Coloma.
SAMUEL DODD	Lincoln.

ON STATISTICS.

GEORGE JOHNSTON	Sacramento.
GEORGE W. APPLEGATE	Placer.
I. N. HOAG	Yolo.
L. R. CHAMBERLAIN	Placer.
S. L. WILSON	Sacramento.
JOEL CLAYTON	Clayton.

ON MEMORIAL TO CONGRESS.

B. D. WILSON	Los Angeles.
H. LARKIN	El Dorado.
L. M. SCHRACK	Mokelumne Hill.
GEORGE JOHNSTON	Sacramento.
A. HEWEL	Knight's Ferry.
ROBERT CHALMERS	Coloma.
I. N. HOAG	Yolo.
A. SCHELL	Knight's Ferry.
SAMUEL DODD	Lincoln.
MR. CALDWELL	Sonoma.
S. L. WILSON	Sacramento.

ON THE BEST VARIETY OF GRAPES FOR GENERAL USE.

J. R. NICKESON	Lincoln.
GEORGE WEST	Stockton.
J. J. OTT	Nevada.
JOEL CLAYTON	Clayton.
SAMUEL DODD	Lincoln.
D. CHAMBERLAIN	Yuba.
DR. LOCKWOOD	St. Helena.
C. G. CARPENTER	Diamond Springs.
I. N. HOAG	Yolo.
JOHN H. CARROLL	Sacramento.

ON CLASSIFICATION OF GRAPES.

J. A. LOCKWOOD	St. Helena.
J. STRENTZEL	Martinez.
J. R. NICKESON	Lincoln.
J. DE BARTH SCHAUB	Los Angeles.
I. N. HOAG	Yolo.
J. H. CARROLL	Sacramento.
WILLIAM McP. HILL	Sonoma.
GEORGE JOHNSTON	Sacramento.

ADDRESS.

BY G. G. BLANCHARD, PRESIDENT.

The seasons in rounds of bounty and weather are scarcely more constant and punctual than we. Each returning Fall, with its fruits, brings us together for congratulation and advice, and affords us opportunity to give the "reasons why" and occasion for the "thus you see" of the year's employment. This annual "come and go"—this periodical "fetch and carry"—in ways many and various contribute to our prosperity as individuals—to the prosperity of State—to our social progression and happiness.

One more year have we watched, considered, and dressed our growing vines. One more year have we racked and reracked, tested, and tasted its liquid product. For one year more have we applied to the culture of the one, and the improvement of the other, our entire stock of knowledge and ingenuity, and now here, upon the altar of this industry, do we offer up the result, and ask the descent of the latent mysteries of vine culture and wine making upon our offering.

While we have been thus nobly engaged the contending political forces have been busily applying their dogmas to public needs, and untiring in their efforts to secure our recognition and support. Besotted selfishness and unholy avarice are the seeds of the evils to which we are the prey. Our wines are delicious, our fruits both palatable and nourishing, our presence upon the soil makes it inviting, and gives increase to the national exchequer; yet, as a class, the vine grower has but a small voice in the political economy of the State or nation.

There will be produced this year from twelve to fifteen millions of gallons of wine, of the value of three million five hundred thousand dollars; besides, about two millions of pounds of grapes, for table use, worth about two hundred and fifty thousand dollars; and one quarter of a million pounds of raisins.

There is not within this State to exceed forty thousand acres planted to vines. Of hill and mountain land alone, which is eminently susceptible to the cultivation of vines, there are more than eight millions of acres.

With reasonable cultivation, and without diminishing any of the other productions of the State, we have acres sufficient to produce annually from the vine more than two hundred million dollars; and these lands are mostly unsuitable for any other production as a staple. Our highest prosperity will never be reached until the occupation of these lands is made an element of legislation—until the subject shall receive encouragement and aid. Commerce is not to be forgotten; manufactures should not be overlooked, nor our mining interests neglected; neither should this greatest and most natural resource of the State—vine growing—be made the subject of legislative oppression.

The husbandman is the atlas upon whose back the world's life is supported; and he has ever, with silence and humility, borne the burden. While exemption from taxation has been the order, his results have ever been listed for assessment. His surplus is the subject of tariff upon tariff.

Our requirements have never been understood by political economists; our liquors are gauged when new and at highest proof. No account or allowance is made by the officers of revenue for evaporation, leakage, or deterioration. Our wines and liquors stand to us as our growing crops, and only ripen at from three to five years after the time they are manufactured; yet, while in this state of incubation, they are listed and taxed from year to year, when they only have value as they mature. The present system of taxation is unjust and oppressive, and affords but poor encouragement to industry. The burdens rest almost wholly upon the owners of real estate; while bankers, brokers, and those who deal in securities and exchanges, are exempt from taxation. The value of all the real estate and personal property of the United States in eighteen hundred and sixty, was sixteen billion eighty-six million six hundred and sixteen thousand and sixty-eight dollars (which included slave property); in eighteen hundred and seventy it amounted to thirty billion eight hundred and twenty-two million five hundred and thirty-five thousand one hundred and forty, leaving out the slave—more than doubling in a decade. This increase is unprecedented in history. Yet this fabulous increase cannot be said to result from an increase of farming area, or farm products, for the improved lands of the United States in eighteen hundred and sixty amounted to four hundred and seven million two hundred and twelve thousand five hundred and thirty-eight acres, while in eighteen hundred and seventy there were only four hundred and seven million seven hundred and thirty-five thousand and forty-one acres, showing an increase in the ten years of only five hundred and twenty-two thousand five hundred and three acres. These figures demonstrate that the increase has been principally in lands not agricultural, and of personal property not the product of the soil. While farming lands and farming products have increased, yet it was disproportionate to the increase of other lands and other commodities, considering the cheapness of lands, the extent of our arable domain, and the better price of its products. Query: Does this show a healthy state of things? I think not. When, in a purely agricultural country, agriculture is at a double discount, when men will forsake the plow for a standing place in a city, and abandon the law of induction, applied to vegetable mold, for a chance of a freak in the dice of fortune, applied to the shadow of a vision at some curbstone, the one must be shrouded with burdens that frighten, or the other be gilded with reliefs that dazzle. All burdens are distasteful. But the most unsavory is American taxation. The toiler has no time to hide—in fact he cannot hide—his effects from revenue officials; for the most part they are bulky and just about him, while he that luxuriates in his percentum and illicit traffic may escape the tax gatherer. Our system of political economy does not stop to consider with any degree of niceness the wrongs done a class whose very business makes it unlikely they will raise any very potent voice in their own behalf. The law makers are not, as a class, those upon whom the hand of the Government falls heaviest. Aye, they, too often, are those whose hand is most heavy upon the Government—and upon whom the Government has no hand. Extravagance is the rule, economy the exception. A true citizen never advances his own interests at the expense of the community in which he lives. Query: Are those bad citizens who do? But extravagance always leads to corruption, and both are fueled and fanned by party bias and party rule. An honest difference of opinion, springing from diverse conceptions of untried theories and national polity, is always entitled to respect; but political distinctions originating in the vanity of wealth—a debauched sense of class superiority—fevers of ambition, or in the advantage of a popular spasm, should be intolerable, and condemned as factional.

National prosperity, by a false estimate, is said to overlay a nation's wealth, and, with equal falsity, it is said that the prime duty of a Government is to preserve and aggregate its wealth.

When a Government has no higher object than monetary advancement, its stability is enervated, its health devoid of vigor, and its longevity problematical. Prodigies of virtue, statesmanship, and valor seldom spring from palaces of luxury. The sons of poverty, for deeds of honorable merit and renown, always defy and rout the aggregated powers of opulence. The voluptuous myrmidons of Persia, for valor and virtue, paled into littleness before the peasant youth of humble Sparta. The Roman invincibles carried their victorious eagles into the rich but festering Egypt and Persia, where opulence and venality were the rule.

Principles of genuine loyalty and political virtue are deep-rooted and immovable in the poor. Preservation of material wealth is not the motive which sends a yeoman to the front. His battle-song is of liberty and the republic, instead of gold and silver. A city burned or a fleet scattered, to the true defender, give no qualms of property lost. The opulent commercial sons of Carthage for gold sold her liberties and independence, despite the entreaties of her toiling people.

Before Spain was gorged with metals of Sacotesas and Potosi, her enterprise and her virtue walked hand in hand—her moral power was only equaled by her national activity. The mistaken idea that wealth was national prosperity lowered the Spaniard from his superior rank, and his Government from a first to an insignificant power.

Adherence to the soil is a specific remedy for the unstable condition of public mind. The plow and cultivator agitate nothing but earth.

He that causes a blade of grass to grow where none has grown before, is greater than he who commands an army.

Wealth produces pride of dominion, and pride of dominion is corrupting; wealth furnishes the vitals of corruption; venality is its most nourishing aliment, and contamination its most refreshing atmosphere.

Reunions like this tend to universalize class knowledge and disseminate principles of industrial virtue. They clear away the miasma arising from pools of sloth and from political defection. They dignify and give notoriety to that which, without them, would be devoid of recognition or respect beyond a common and passing mention.

Aggregated, we are a power, and the knowledge of all becomes the knowledge of each.

Grape growing and wine making are steadily advancing on a permanent basis. The frost of the month of April last not only proved disastrous to California, but also to nearly all the vineyards in Europe; and from accounts from there, not more than a third of a crop is expected to be harvested. Important observations made by the Signal Office during the last year show the phenomena of a great atmospheric wave passes eastward from the coast of the Pacific, and extends even to Europe. This wave has been known on the coast of England for years, and may be the westerly current that the aerial navigators expect to take at New York to reach Europe. These westerly winds sometimes carry with them very cold currents that freeze the tender plants in the Spring. The frosts that damaged the vines in Europe, occurred in April, on or about the twenty-fourth of April; in California, this cold current swept over the country about the fifth of April. The wave reported by the Signal Office, which occurred on the Coast of Oregon on the twelfth of November, eighteen hundred and seventy-two, and spread over the Pacific States and Territories and Utah and Nevada, passed through the Rocky Mountains on the fourteenth of November, and also through Colorado, through the United States, and probably on to Europe.

The difference in time between the frost in April in California, and those in France in the month of April, eighteen hundred and seventy-three, was about nineteen days; it being nineteen days later in France than in California. There are some atmospheric influences which seem to govern the grape-growing districts in both hemispheres, and they occur at similar seasons; they have been observed by persons who have paid attention to such subjects.

The philloxera, which made its appearance in Europe, has also been discovered in California. This may be owing to atmospheric influences, probably, as some think, from the large amount of magnetism which has been thrown out through the solar system by the sun for the two years past; and this may have something to do with generating a particular class of insects. Accounts from France do not say so much about the philloxera as they do about frost.

It is the opinion of gentlemen who have been engaged in the grape-growing business for fourteen years or more, that the philloxera have been among the vines all that time, and as yet have done no serious injury. Those vineyards that seem to suffer the most have been neglected, or have been badly attended to. Lice will generate on a person who does not keep himself clean and well cultivated.

Grape growers who have studied the character of the philloxera are of the opinion that a wet Winter will destroy them. A gentleman in France got rid of them by inundating the vines, and in the midst of much destruction around him, his vineyard remains green and in a flourishing condition. There are vineyards in which they cannot be found, and some in which they are rarely found.

I have no fears that any vineyard will be destroyed by insects of any kind where good cultivation and care has been bestowed.

The philloxera scare in Europe has doubtless been exaggerated. Reports from France are not so unfavorable as they were at first represented. It is said that they will have a fair average crop in some parts of France, notwithstanding the frost. The vineyards of Provence also are said to afford a beautiful aspect, and in spite of their sufferings from the philloxera, they promise also a fine crop. In the Southern Departments the news is flattering from the grape crop. In Savoy, the quantity will not be more than one third below the average. The vines in Beaujolais and Maconnais are also in a condition entirely satisfactory. From Cote d'Or the news is also of a satisfactory character. From all accounts, the frost has done more damage in France than the philloxera. In a few years, nothing further will be heard of that insect; it will, like all other insects, have run its course.

I have experimented with the insect, and obtained the following results:

August 31st—Placed a piece of the root of a grapevine, with philloxera vertatrix on it, in a glass of water at noon.

September 1st—The root was taken out of the water and the insect examined under a microscope of ordinary power, and not found to have any signs of life; the root was placed in earth in a tumbler; this was in the evening near sunset.

September 2d—The root still remains in the earth in the glass.

September 3d—Took the root out of the earth; examined the insect under the microscope, and found some dead and some alive. Whether the live insect had been hatched from eggs, or that the water did not kill them all, I am not able to decide. Placed the root in water again to-day at noon for another trial.

September 4th—Vines still in water.

September 5th—Examined the insect which had been in water since the third, at noon, it being noon this day; under the microscope it shows no signs of life. Placed the root in earth in a tumbler at noon again.

September 8th—Examined the insects at noon this day, and found them all dead.

A microscopic examination has been made of a number of roots, and the insect can be readily seen with an ordinary magnifying glass; to the naked eye they resemble a yellowish rust.

I have heard that one of those meek and lowly hypocrites had exclaimed thank God, the philloxera bastatrix has got after the vine growers at last; truly a judgment from God! Now it so happens that the intelligent portion of God's creation at this day, know that all things are governed by natural laws; and the grape growers might say should the cholera attack those men, thank God the cholera has got them at last; a visitation from God. There would be quite as much truth in one as the other Such men, instead of doing good, do evil, for they force all sensible men to despise them, if they have ability—to pity them, if they are fools.

The grape growers of California are not discouraged, they intend to make the fight against philloxera bastatrix, knaves and fools, until they are all subdued.

Let each man attend to his own business; as Paul said to Timothy: But continue thou in the things which thou hast learned, and hast been assured of knowing of whom thou hast learned them.

Many men come into California, to creep into houses, enjoy the hospitality of its inmates, and then with a mean and contemptible spirit abuse their kindness; without natural affection, truce-breakers, false deceivers, incontinent, fierce despisers of those that are good.

It would be a pleasant thing if we could get people to tell what they believe, and not play the hypocrite; we have had many instances of that in our public men of late, and among men who were held up to the people as examples of honor and integrity of character. Well, some allowance must be made for opposition on the side of ignorance, and how ignorant the human family are is beyond comprehension; we are all in the same boat.

It has been reported that Professor Dana has now come to the conclusion that the earth is solid; and a Frenchman has written a work demonstrating that heat, electricity, light, magnetism, chemical attraction, muscular energy, and mechanical work are but exhibitions of one and the same power, acting through matter. His book is called the "Unity of Natural Phenomena." This man contends that there is but one material substance, and that is ether fitting the interplanetary spaces in the universe.

Now we contend that there is but one thing that is fit for a man to put into his stomach, to quench his thirst and give strength and vigor to his system—and that is pure wine.

In olden times people of learning did not believe that the earth moved, and Galileo was imprisoned because he said it did move, and he was not released until he recanted. But in his passage over the threshold of the door on going out, he exclaimed: "And still it moves!"

A Catholic priest at San Francisco has lately been lecturing before admiring audiences on the developments of the spectroscope; had he attempted to promulgate such doctrines in Galileo's time, he would have been placed in a lunatic asylum, or his head would have been severed from his shoulders—and still the world moves. Thus ignorance gradually loses its grasp on truth, and people learn to know; and how much better would it be if they would learn to *use*, and use properly, and not abuse the gifts that God has given us. If the temperance societies would change their name and call themselves the society for the dissemination of the knowledge of the proper use of things, and would start off on the explanations of them, they would do more good in one year than they now do in ten under their present system.

There are a large majority of temperance men, as they are called, who do not know the proper uses of things, and are as much if not more intemperate than a confirmed drunkard—the only difference is the temperance man does not show to the world what he is doing, and the drunkard does. If that the food that the Frenchman at New Orleans uses seems to renew his strength, keeps up his muscle, and enables him to support himself and his family by honest labor, what more is required? It sustains life and preserves his strength. I have seen them do a day's work, and their dinner was a bottle of claret and a small loaf of bread. If chips and wet stones could do the same thing, what objections could be made to their use? Agitators, most like hypocrites who take their drink behind the door, must live.

Pious gentlemen, who take care of the Freedman's Bureau, must live; and they take care that the drawers are all empty. Spoons will be carried off if they are not taken care of. Big bladders of wind will deliver lectures on moral subjects to the Young Men's Christian Associations, and when they are pricked out rolls Credit Mobilier stock. Pillars of the church topple over from a superabundance of stolen bank stock. Carpet baggers are seen scudding before the winds of desolation seeking whom they may devour. Poor niggers are saving their hard earnings to fill the already plethoric bags of these skunks who destroy the vegetation wherever they tread. And so it goes—oh, my friends, there is lots of work to do in other vineyards than those of the vine grower.

We would not place some of the men who howl so fiercely against the grape growers among the Credit Mobiliers, because we should not condemn them on Christian principles. When the woman was brought before Christ, who was taken in adultery, and the people wished to stone her, Jesus stooped down and with his finger wrote on the ground, as though he heard them not. And when they continued to ask him, he lifted up himself and said unto them: "He that is without sin among you, let him cast the first stone at her." And again he stooped down and wrote on the ground; and they which heard it, being convicted by their own conscience, went out one by one, beginning with the eldest even unto the last, and Jesus was left alone, and the woman standing in the midst. When Jesus lifted up himself and saw none but the woman, he said unto her: "Woman, where are thy accusers; hath no man condemned thee?" She said, "No, my Lord." And Jesus said unto her: "Neither do I condemn; go thy way and sin no more." Now, my friends, we will suppose that scene were to be enacted at the present day, how many men present do you suppose would leave? Scarcely a man. They would stand with a countenance of meek and lowly hypocritical innocence, and each one would lead you to suppose, by his actions, that the conversation was addressed to his neighbor and not to him. And they say we are progressing. Truly, my friends, I suppose we are.

Grape growing and wine making are steadily progressing on a permanent basis, notwithstanding the exertions of persons employed by parties, from personal and interested motives, to blast this useful and important interest of California. This interest has been assailed with bitterness and vituperation by a set of worthless non-producers who have come to California to better their fortunes by assailing the productive interests of the country, and thus put money in their pockets by their barefaced and unprincipled hypocricy. They come into this State, not to add anything to its wealth, but to carry away all that they may get by fair or foul means. Many of these people will never be heard of again, as soon as they have reaped the harvest of their ill-gotten gains, and return to other scenes of accumulation. They come as the special advisers of California and her people, those who by honest toil have developed the resources of the State while these idle loungers were scattering the venomous ink from their filthy pens. They assail California's best men, and denounce them in bitter terms, while the assailants are not worthy to drink from the same cup with the humblest of the vine growers.

California has for years worked hard to obtain immigration to her shores, and many of her best men have been engaged in this business, and are to this day, while these worthless scribblers and non-producers are exerting themselves to prevent immigration from coming by assailing the character of her people; penny liners and scribblers, who, forsooth, know more than our citizens, and who came here to instruct men who were in the country before they had their breech clouts removed. They have the impudence to abuse our citizens, and also denounce them as drunkards; and these fellows do not probably pay a cent into the public treasury for the support of the Government under which they live and have protection. Such is the basest insolence, and they deserve to be treated with scorn and contempt. This is rather an unpleasant duty to perform; nevertheless it becomes necessary that something should be said in our defense, or we will be denounced as cowardly wretches as well as drunken beasts. It is a little remarkable that the grape growers and wine makers should be selected as a tarket for such venom shafts, while the whisky ring, which controls the whole country, is permitted to go unwhipped. Is this ring so powerful that a newspaper stipendiary dares not assail it; or is it the old story, it is not policy to do so, it does not pay?

These insects are worse than the parasites which feed on the roots of the vines; unable to add anything to the wealth of the community in which they live, they undertake to sap the foundations of industrial pursuits; and, like all non-producers, roar with blatant sound and intense fury for the moral welfare of the people.

In the wonderful movements of the great globes, and fiery suns, and long tailed comets, which traverse immensity without ever deviating from their safe orbits, we recognize a great law of nature which men term attraction. In the creation and sustenance of man, the nourishing and wasting of the parts, the generation of warmth and strength, and all the complex modes by which the phenomena of life are developed out of the dead materials of surrounding nature, we behold the same law here known as chemical affinity, ruled over by the mysterious vital forces. For the purposes of human life, a variety of subjects, in divers quantities, proportions, and combinations, with properties but few of which we can comprehend the nature of, are needed to be selected with exact care from the vast storehouses of the useful and the trustful, and introduced into the body.

For this, too, a law is needed, and it is given, under the form of appetite—another manifestation of the universal law of attraction. In the adoption of this mode of sustaining animal life—in the inscribing of His laws in this respect upon the living tablets of physical desire—it is not recorded that the Creator took the creature man into His counsel; on the contrary, reason teaches that it is a department as little pertaining to what is called free will, or moral responsibility, as the movements of the heavenly bodies or of the chemical elements. God has been contented with writing them where he has, without trusting to the erring hand of men to engross them on parchment, or revealing erring human judgment the reasons that prevailed in their institution.

The native of the Polar regions, sitting on a lump of ice, and making a dinner of seal's meat and blubber, with a dozen candles for dessert, knows—deep in his vitals—that he dearly loves grease, but knows nothing at all about the warming properties of carbon, and very little about anything else.

The South Sea Islander, who discends whales' fat, and eats only such food as holds about twelve per cent of carbon, would be one of the last persons in the world to take the trouble of investigating what would be the effect on his biliary secretions of an over supply of that chemical element.

The baby at the breast sucks at the pleasant fountain with the greediness common at that age, and then sleeps as greedily, without caring one straw for the theory by which gray-haired science would scientifically account for the importance of certain proportions of caseine, butter and sugar of milk, and of much sleep to those of an age where supply so largely exceeds waste.

Those Northern Germans who besought the Pope to dispense with the half of Lent, could not lay their fingers on a single text of Scripture which explained the importance of hearty feeding to dwellers in cold climates, but could only lay their hands pathetically on their stomachs and declare that they were hungry beyond endurance.

The stubborn Englishman in India, who disregards the failing appetite, which warns him not to eat too much mutton, nor drink porter at all, but who insists on peppering and salting his stomach till it is provoked to depart from nature's laws, finds no safe rule of diet, save that inscribed on the membrane of his palate.

Again, the North American Indian, whose substance is subject to such rapid waste, delights in the fumes of tobacco, which, by retarding that waste, renders hunger endurable, without ever suspecting that it is an empyreumatic which he puts in his pipe and is smoking.

The indolent, fine lady who neglects to take exercise which should produce from the waste of tissues nitrogenized substances by which bile is formed from food, is content to drink her coffee, chocolate, and tea, from which, and from asparagus, the deficiency and scarce anything else can be supplied, without laying aside her novel to bother her head with chemistry.

So the poor Dutch prisoners who disrelished the unsalted bread which, for their sins, the Government used to feed them with, were equally ignorant of the part performed by that stimulant in the animal economy, though when they died, as they used to do, of worms in their blood, they rightly suspected that something was wrong.

Thus, it is seen that appetite pertains to nature and not morals. It is chemistry, and not conscience, that is in question; nutrition, and not civil policy, that is involved; a creative, and not a social proceeding that occurs when the palate, the nostrils, or the pores demand what they desire, or reject what they hate.

It is not worth while to undertake to restrain by any law the use of wine or anything else that man craves. So much has been said on this subject that it is almost worn threadbare.

The cultivation of the grape will continue, and wine will be made and drank as long as we have a population and as long as our wills remain, unless changes of climate operate to produce a contrary effect; and we may naturally look for such a change, for it is said that in parts of France where the Muscat grape ripened and produced good fruit, it does not now ripen sufficiently to produce good wine. In some parts of the earth the land is rising, and in other parts it is sinking. The whole coast of California is said to be rising, while the land along the great lakes of the United States is slowly sinking.

The importance of the cultivation of the grape becomes more apparent from day to day. The adulteration of liquors as well as of food has occupied the attention of persons not only in the United States but also in England for some time. The Boston *Post* speaks of an address before the College of Pharmacy by Mr. Hillard, who alluded to the alarming prevalence of adulteration. "Everywhere," he said, "there was death in the pot; our bread, our butter, our flour, our milk, our pickles, are poisoned, and it is one of the chief tasks of the pharmacist to counteract the deleterious effects of the adulteration of food and drink."

The pharmacist is not the only agent of relief; it is yet more necessary that there should be measures of prevention than measures of cure; and the stern action of government must be a principal medium for attaining this end. The spirit "of *murder*, working in the very means of life," is to be met henceforth in England by more stringent laws than heretofore. Adulteration of food and drink is surely one of the gigantic material evils of our time, and we must have paternal legislation; there is nothing to which it and its police auxiliary can be more usefully directed. Developments are constantly being made in regard to the substances that daily make their appearance upon our tables, which should startle every man and woman in the community into vigorous coöperation against attacks, all the more dangerous as they are insidious, against the health, and, in not a few cases, against the very life of our household.

The spirit of gain has become so very rampant, the competition is so sharp, and especially among the retail dealers, and adulteration is getting to be so much a matter of course in certain materials, that even tolerably honest men are becoming accustomed to regard it either as something they must do to keep pace with their neighbors, or as a proceeding which does not turn out to be so dangerous after all. No sanitary legislation or supervision is anything like complete, unless the prompt exposure and stern punishment of adulteration form a foremost object.

Nor is the evil confined to solid substances, to sugar, and coffee, flour and meal, the every-day commodities of the kitchen. The wine and spirits, the malt liquors, and even our cider, are, to use the poet's short and sharp expression, "forged" and, as a result, he well exclaims, "The vitriol madness rushes up in the ruffian's head."

The evils of drunkenness are rendered tenfold more deplorable by the poisonous admixtures intended to bring an illicit profit, while the use of wines for sickness becomes dangerous, and is quite as likely to intensify as to assuage the malady.

It is a singular fact that very few articles of either food or drink can be successfully adulterated without the aid of actual poison.

We might profitably take a leaf from English legislation in dealing with a crime so readily committed, and so sure and serious in its effects. The new law punishes the first offense with a fine of fifty pounds sterling, and a second with an imprisonment with hard labor six months; while the seller, though not an adulterer of tampered goods, is fined twenty pounds sterling for a first offense, and, if it is repeated, is published in the newspapers, at his own expense. Quite as important as are the penalties imposed, is the system to be adopted of detecting adulterations.

The evil has grown to such proportions that it may be mooted whether a special organization of experts might not be formed with advantage to the cheated and poisoned community. And still we find men who are constantly denouncing the use of a pure and useful beverage—wine—while the whole community are being poisoned by just such adulterations as have been described. Dr. Hodges, of Belfast, has recently had occasion to analyze several samples of whisky, and has published the results of his examination in one of the Dublin papers. A bottle of whisky, described as a fair sample of the drink sold in low-class public houses, was, on examination, found to be heavily adulterated with naphtha, cayenne pepper, and vitriol. Another sample was composed almost entirely of naphtha, slightly colored with genuine whisky; and a third delectable compound had not even a "coloring" of the genuine whisky, being a pleasing combination of cayenne pepper and oil of vitriol, alcohol and sulphate of copper, which could be produced by any amateur chemist at the rate of one penny per gallon. The physical results to the consumer of such a decoction can be imagined.

As to the use of wine and its effects on the human system, statistics furnished by the Census Bureau show a curious state of affairs as regards the moral and sanitary condition of the people.

In the States of Maine, Massachusetts, and Michigan, where stringent temperance laws exist, and are enforced, the ratio of direct is higher than that of indirect self-destruction; that is to say, that more people shoot, poison, hang, and drown themselves, than put themselves out of th way with alcohol.

In the States of Maryland and Missouri, where there is laxity in the legal morals, the ratio of indirect is higher than that of direct self-destruction; that is to say, fewer people shoot, hang, or drown themselves than put themselves out of the way with alcohol. In Maine, where a prohibitory liquor law exists, the proportion of suicides is one in twenty-five thousand, and from the use of alcohol, one in seventy thousand; while in Missouri, where no such law is in existence, the rate is reversed; the proportion of the first is one in thirty-nine thousand; in that of the last, one in twenty-three thousand. In Massachusetts the proportion of suicidal deaths is one in seventeen thousand; of alcoholic, one in thirty-four thousand; while in Maryland the proportion of the first is one in seventy-eight thousand, and of the last, one in forty-one thousand. It appears further, that taking the two modes of self-destruction together, the ratio is higher in the prohibitory States.

In Maine it is one in eighteen thousand five hundred; in Massachusetts, one in eleven thousand five hundred; in Maryland, one in twenty-seven thousand, and in Missouri, one in fourteen thousand six hundred.

It becomes necessary to unveil the truth when the wine interest of this State is attacked by any partisan of any cause; and the wine makers have plenty of material to refute the lame and visionary arguments that are made use of by persons badly qualified to enlighten the people.

There is strong evidence that suicide prevails, to a greater extent, in States where there are prohibitory liquor laws, than in States where there are no prohibitory laws.

The grape growers of California do not evince that interest, as a body, in the business that they should. There is much information to be had by organization, and it also gives them strength to combine against their enemies, and also to disseminate useful information regarding the cultivation of the grape and of making wine. In parts of this address I have copied from my annual address to the grape growers of Napa, Solano, and Sonoma. More attention should be given to the cultivation and care of the soil.

We should also have a good microscope, for the purpose of examining plants, and for the inspection and investigation of diseases of the vines and insects infesting the same. Our Committee on Grapevines should make an elaborate report on the character of our soils. I herewith give a tabular statement of the analysis of the grape wood, grape seed, grape skins, wine grounds or settlings, the must, and the wine:

	Ash, per cent...	Potash	Soda.........	Magnesia	Lime	Phosphoric acid	Sulphuric acid..	Silica.........	Chlorine.........
Grape seed.........	2.18	28.60	....	8.60	39.90	24.00	2.50	1.10	0.30
Wood.........	2.75	29.80	6.70	6.80	37.30	12.90	2.70	0.80	0.80
Wine grounds.........	4.60	8.60	0.10	1.00	2.10	3.40	0.70	0.60	0.10
Grape skins.........	16.20	8.00	....	....	0.20	0.20	0.50	0.10	0 10
Must.........	....	62.80	0.90	5.60	4.90	17.70	6.50	1.30	0.60
Wine.........	2.80	....	1.80	....	0.20	0.20	0.50	0.10	0.10

—[From *How to Grow Grapes*, by Johnson.

From this statement we are enabled to discover at once the properties which the grapevine appropriates to itself in the production of fruit and its growth. With this tabular statement each can perceive at a glance what the vine takes from the earth each year. This is another subject of importance to the grape grower. That which has been taken from the soil should in some manner be put back to preserve the due proportion of material necessary for the construction of the plant and the fruit. I am very sorry to say our committees have not touched on such subjects to any extent.

We must have more life and activity infused into this association if we expect to produce beneficial results.

I have pursued the plan of putting back to the soil, as far as possible, that which has been taken from it. For three years past I have cut up all the prunings from the vines and left them on the soil. The seed and the husks, or skins, are also dealt with in the same manner. I am of the opinion that, as a general thing, in the Counties of Napa, Solano, and Sonoma, there is a deficiency of lime in the soil, and lime seems to play an important part in the production of the grape; also other mineral substances—ashes, for instance—seem to be desirable.

Foreign Consuls have made inquiry to know if the insect which has attacked the roots of the vine in Europe exists in the United States. Foreign papers have stated that the insect came from cuttings and roots of the vine sent fron the United States. The matter came up before the Sonoma Vinicultural Club, and no one seemed to know anything about it, although, as said before, vines take a dry rot at the root and die here in California; but the matter has not been investigated.

A question arises whether the constant and long continued use of cuttings taken from the grapevine has not a tendency towards deterioration; and when we reflect that sometimes the cutting sent away from a diseased vine (and I have seen many in bundles, that were diseased with mildew) may not be transporting the disease from one point to another, until we may have it all over the State. Care should be taken in regard to such matters, whether attention should not be given to the cultivation of seedlings, and thereby get a new and more vigorous stock. Argument, however, may be made use of to prove that if disease exists in the cane or wood from whence the cutting is made, the same would be found in the seed. All these suggestions are thrown out to lead to a vigorous discussion of matters which are of vital importance to grape growers.

Great care should be taken as to the manufacture of wine, to preserve our wines in their original purity, for this is our strong point. We are sorry to say that inferior wines are sold, and wines that are pricked and spoiled, the acidity being disguised or modified by the addition of water, to reduce it, and also an addition of alcohol, to bring the wine up again to its proper standard of strength.

More inferior wine is sold at a low figure than any other kind, and also the bulk of all the wine that is sold and shipped to the East is not over two years old. This is predicated on the fact that nearly all the wine cellars are empty, and but few persons have any wine for sale that is over two years old. Wine that is young and not thoroughly ripened, when taken into the stomach, immediately enters a temperature of ninety-two degrees Fahrenheit, where it undergoes a fermentation. This is the cause of our wines being called "heady" by foreigners and the wine drinkers of the Atlantic States.

Many wines are fortified, as it is called, by the dealers; this means an addition of alcohol, to carry it to the place of destination, either by sea or rail—this is in consequence of its newness. It has been proven by analysis and reports made to this association that our wines are not stronger than the wines of France. Statistics showing the temperature of the valley of Sonoma have been published some years since, proving that the average temperature of Sonoma Valley and that of the Bordeaux wine districts are identical. Now, every grape grower knows that all other things—such as soil and locality—being equal, the results as to the proportion of alcohol will be the same, for it is the heat of the sun that ripens the grape and produces the saccharine matter. The quantity of saccharine matter required in Europe to make a good wine is twenty-four per cent. This will give twelve per cent of alcohol when thoroughly fermented.

Wine containing less than that must have had the strength reduced, or the grape was taken from the vine before it was perfectly ripe. There are many persons who assert that such should be done to make wine that will produce bouquet.

It may be well to try the experiment. I have to a small extent tested it, and produced a very fine wine, with a fine flavor or bouquet. Must that does not contain too much sugar, will sooner complete its fermentation and sooner be fit for use. Must that contains much sugar will be a much longer time in developing or maturing. There is no doubt but that a must that is rich in saccharine matter will produce a more durable wine. It would be well to experiment with grapes that are not too ripe, especially for red wine made from the Zinfindal grape. Some persons have added water to the must before fermentation. This will reduce the strength, but may destroy the fine properties of the component parts of the juice of the grape. If water is added, it should be distilled water, for there is no part of the world where mineral substances are found more frequently in combination in water than in California.

The following extract is taken from the *Morning Call* of the fourteenth of September (Sunday), from which it appears that the phylloxera scare in France is already abating; so it seems that there should be no needless alarm about it:

> "The *phylloxera* is the Tom Thumb bug which attacks the vines, and, like the potato blight, no cure has yet been discovered. According to the *Univers*, the chief papal and kingly organ in France, Providence has at last interfered. The bug has been called to order; the vine has been spared, just like wheat, because both are required in the ceremonies of religion, although both have been abused by drunkards and gluttons. But the worst is over. Heaven has been appeased; it has delivered France from Thiers, from Prussia, from Orleansism, from the *phylloxera*, by the pilgrimages; and the best of all remedies for the vine bugs is to shake a mixture of sulphur and charcoal on the rogues, bring back Henri V, and not afflict him with a Parliament. Thanks to a lower temperature, France enjoys a good laugh at this."